East Flagstaff Traffic Interchange

Draft Environmental Assessment

Project No. STP 089-C(ABM)
TRACS No. 089 CN 418 H5106 01C

September 2004

Draft Environmental Assessment

for

East Flagstaff Traffic Interchange

Coconino County, Arizona
TRACS No. 089 CN 418 H5106 01C
Project No. STP 089-C(ABM)

Approved by: _____ On: 9.28.04
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This environmental assessment has been prepared in accordance with provisions and requirements of Chapter 1, Title 23 USC, 23 CFR Part 771, relating to the implementation of the National Environmental Policy Act of 1969.

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LIST OF ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disabilities Act
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
AGFD	Arizona Game and Fish Department
APS	Arizona Public Service Company
ARHP	Arizona Register of Historic Places
ASLD	Arizona State Land Department
AZPDES	Arizona Pollutant Discharge Elimination System
BNSF	Burlington Northern and Santa Fe Railway
B-40	Business Route 40
CAAA	Clean Air Act Amendments of 1990
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
COE	US Army Corps of Engineers
dBA	A-weighted sound level in decibels
DCR	Design Concept Report
EA	Environmental Assessment
EB	eastbound
EPA	US Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FUTS	Flagstaff Urban Trail System
HSHS	Historic State Highway System
I-40	Interstate 40
kV	kilovolt
Leq	equivalent energy level
LOS	level of service
MP	milepost
NAAQS	National Ambient Air Quality Standards

NAC	Noise Abatement Criteria
NAP	Noise Abatement Policy
NB	northbound
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
PM_{10}	particulate matter less than 10 microns in diameter
ppm	parts per million
R/W	right-of-way
SB	southbound
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
STIP	State Transportation Improvement Plan
SWPPP	Stormwater Pollution Prevention Plan
TCE	temporary construction easements
TI	traffic interchange
US	United States
WB	westbound

MITIGATION MEASURES

The following mitigation measures and commitments are not subject to change or modification without prior written approval of the Federal Highway Administration.

Arizona Department of Transportation Design Responsibilities

1. The Arizona Department of Transportation would ensure that project lighting is designed in accordance with the City of Flagstaff Lighting Code (*Division 10-08-002. Development Lighting Regulations of the Flagstaff City Code*). (Refer to page 39.)

2. The Arizona Department of Transportation would coordinate with the utility companies on relocation of utilities, including the reestablishment of required vertical clearances, during the final design phase. (Refer to page 54.)

3. The landscape and aesthetic treatment plans would be reviewed and approved by the City of Flagstaff, Coconino County, and the Arizona Department of Transportation during the design phase. (Refer to page 55.)

4. The City of Flagstaff Floodplain Administrator (928-779-7685) would be provided an opportunity to review and comment on the design plans. (Refer to page 56.)

5. All required Clean Water Act Section 404 Permits and Section 401 Water Quality Certifications would be obtained by the Arizona Department of Transportation prior to any work in waters of the United States. (Refer to page 58.)

6. All disturbed soils that would not be landscaped or otherwise permanently stabilized by construction would be seeded using species native to the project vicinity. (Refer to page 60.)

7. All earthmoving and hauling equipment would be washed prior to leaving the construction site to prevent invasive species seeds from leaving the site. (Refer to page 60.)

Arizona Department of Transportation Roadside Development Section Responsibilities

1. The Arizona Department of Transportation Roadside Development Section would determine who would prepare the Stormwater Pollution Prevention Plan. (Refer to page 58.)

Arizona Department of Transportation Flagstaff District Responsibilities

1. Because more than 1 acre of land would be disturbed, an Arizona Pollutant Discharge Elimination System permit would be required. The Flagstaff District would submit the Notice of Intent and the Notice of Termination to the Arizona Department of Environmental Quality. (Refer to page 58.)

Contractor's Responsibilities

1. The contractor would coordinate with the Superintendent of the Flagstaff Unified School District (928-527-6000) 14 calendar days prior to traffic-disrupting activities to allow for coordination of school bus routes during construction. (Refer to page 35.)

2. The contractor would coordinate with the office of the City of Flagstaff Fire Chief (928-868-7609) 14 calendar days prior to construction activities to inform it of detour routes and closure dates and durations. (Refer to page 36.)

3. The contractor would coordinate with Mountain Line (928-779-6624) prior to any traffic-disturbing activities to allow for planning for bus route detours and delays during construction. (Refer to page 38.)

4. The majority of the construction activities would occur during the daytime except when the contractor and the Resident Engineer determine that nighttime construction would be necessary. (Refer to page 53.)

5. Because more than 1 acre of land would be disturbed, an Arizona Pollutant Discharge Elimination System permit would be required. The contractor would submit the Notice of Intent and the Notice of Termination to the Arizona Department of Environmental Quality. (Refer to page 58.)

6. All earthmoving and hauling equipment would be washed at the contractor's storage facility prior to arriving on-site to prevent the introduction of invasive species seed. (Refer to page 60.)

7. Vehicles not involved with construction, such as inspection or supervisory-type vehicles and contractor personnel vehicles, would be staged in an area where there are no invasive species present. The contractor would contact the Arizona Department of Transportation's Natural Resources Management Section to inform the Arizona Department of Transportation of the wash site and

staging locations, so that these areas can be monitored and treated as appropriate. (Refer to page 60.)

8. All disturbed soils that would not be landscaped or otherwise permanently stabilized by construction would be seeded using species native to the project vicinity. (Refer to page 60.)

9. All earthmoving and hauling equipment would be washed prior to leaving the construction site to prevent invasive species seeds from leaving the site. (Refer to page 60.)

Standard Specifications included as Mitigation Measures

1. According to *Arizona Department of Transportation's Standard Specifications for Road and Bridge Construction*, (2000 Edition), Section 107, "Legal Relations and Responsibility to Public," Subsection 05, "Archaeological Features," "[w]hen previously unidentified archaeological, historical, or paleontological features are encountered or discovered during any activity related to the construction of the project, the contractor shall stop work immediately at that location and shall take all reasonable steps to secure the preservation of those resources and notify the Engineer." The Arizona Department of Transportation Engineer would, in turn, notify Environmental & Enhancement Group Historic Preservation Team (602-712-8636) to evaluate the significance of the resources. (Refer to page 46.)

2. According to the *Arizona Department of Transportation Standard Specifications for Road and Bridge Construction*, (2000 Edition), Section 104, "Scope of Work," Subsection 08, "Prevention of Air and Noise Pollution," "[t]he contractor shall control, reduce, remove or prevent air pollution in all its forms, including air contaminants, in the performance of the contractor's work." The contractor would comply with all air pollution ordinances, regulations, orders, etc., during construction. All dust-producing surfaces would be watered or otherwise stabilized to reduce short-term impacts associated with an increase in particulate matter attributable to construction activity. (Refer to page 51.)

3. According to the *Arizona Department of Transportation Standard Specifications for Road and Bridge Construction*, (2000 Edition), Section 104, "Scope of Work," Subsection 08, "Prevention of Air and Noise Pollution," "[t]he contractor shall comply with all local sound control and noise level rules, regulations and ordinances which apply to any work performed pursuant to the contract. Each internal combustion engine used for any purpose on the work or related to the work shall be equipped with a muffler of a type recommended by the manufacturer." (Refer to page 53.)

4. According to *Arizona Department of Transportation's Standard Specifications for Road and Bridge Construction*, (2000 Edition), Section 104, "Scope of Work," Subsection 09, "Prevention of Landscape Defacement; Protection of Streams, Lakes, and Reservoirs," "[t]he contractor shall give special attention to the effect of its operations on the landscape and shall take special care to maintain natural surroundings undamaged." (Refer to page 55.)

5. According to *Arizona Department of Transportation's Standard Specifications for Road and Bridge Construction*, (2000 Edition), Section 104, "Scope of Work," Subsection 09, "Prevention of Landscape Defacement; Protection of Streams, Lakes, and Reservoirs," the Flagstaff District would ensure that, "[t]he contractor shall take sufficient precautions, considering various conditions, to prevent pollution to streams, lakes, and reservoirs with fuels, oils, bitumens, calcium chloride, fresh Portland cement, raw sewage, muddy water, chemicals, or other harmful materials. None of these materials shall be discharged into any channels leading to such streams, lakes, or reservoirs." (Refer to page 59.)

6. According to *Arizona Department of Transportation's Standard Specifications for Road and Bridge Construction*, (2000 Edition), Section 107, "Legal Relations and Responsibility to Public," Subsection 07, "Sanitary, Health, and Safety Provisions," should the contractor encounter potential hazardous or contaminated material, the contractor would immediately stop work and remove workers, barricade the area, provide traffic controls and notify the Arizona Department of Transportation Engineer. The Arizona Department of Transportation Engineer would arrange for proper assessment, treatment, or disposal of those materials. Such locations would be investigated and proper action implemented prior to the continuation of work in that location. (Refer to page 62.)

7. According to *Arizona Department of Transportation's Standard Specifications for Road and Bridge Construction,* (2000 Edition), Section 1001, "Material Sources," Subsection 2, "General," any material sources required for this project outside of the project area would be examined for environmental effects, by the contractor, prior to use, through a separate environmental analysis. (Refer to page 62.)

8. According to *Arizona Department of Transportation's Standard Specifications for Road and Bridge Construction,* (2000 Edition), Section 107, "Legal Relations and Responsibility to Public," Subsection 11, "Protection and Restoration of Property and Landscape," "[m]aterials removed during construction operations such as trees, stumps, building materials, irrigation and drainage structures, broken concrete, and other similar materials shall not be dumped on either private or public property

unless the contractor has obtained written permission from the owner or public agency with jurisdiction over the land. Written permission would not be required, however, when materials are disposed of at an operating, public dumping ground." The contractor would dispose of excess waste material and construction debris at a municipal landfill approved under Title D of the Resource Conservation and Recovery Act, construction debris landfill approved under Article 3 of the Arizona Revised Statutes 49-241 (Aquifer Protection Permit) administered by the Arizona Department of Environmental Quality, an inert landfill, or at another approved site. (Refer to page 62.)

I. INTRODUCTION

A. Need for an Environmental Assessment

This Environmental Assessment (EA) analyzes the potential social, economic, and environmental impacts of proposed changes to the East Flagstaff traffic interchange (TI). It has been prepared to comply with the National Environmental Policy Act (NEPA) of 1969 and the policies of the Federal Highway Administration (FHWA), as the lead federal agency.

The NEPA process provides steps and procedures to evaluate the potential impacts of a proposed action, while providing an opportunity for the public and local, state, or other federal agencies to provide input and/or comment through scoping and information meetings. The magnitude of impacts is evaluated based on context and intensity as defined in the Council on Environmental Quality's (CEQ's) regulations. In addition, this EA provides FHWA and the Arizona Department of Transportation (ADOT) an analysis to use in examining and considering the magnitude of impacts on sensitive social and environmental resources and assists in their decision-making process.

B. Location

The project area is located in the eastern portion of the city of Flagstaff, in Coconino County, Arizona (Figure 1). The project area comprises three components of the State Highway System: US 89, Business Route 40 (B-40), and Interstate 40 (I-40) (Figure 2). Route 66 is currently maintained by ADOT; an agreement to have the roadway become part of the City of Flagstaff's transportation system is currently being negotiated with ADOT. In general, the project area is defined by the area encompassed by Railhead Avenue (north), just south of Fanning Drive (south), I-40 westbound (east), and Lynch and Kasper Avenues (west) (Figure 3).

C. Background and Overview

US 66—the first paved interstate highway in the United States—and US 89 were originally constructed in Arizona in the 1930s. Beginning in 1956, US 66 was gradually replaced by I-40. The I-40/B-40 TI and the East Flagstaff TI were constructed in 1968, at the same time that US 89 was reconstructed. The I-40/B-40 TI was reconstructed in 1972 and 1992 to improve access to the residential communities south of I-40. Flagstaff Mall, located east of B-40 and between US 89 and Route 66, attracts a growing volume of vehicular and pedestrian traffic. The City of Flagstaff has approved a plan to expand Flagstaff Mall to add more retail businesses. There is also a plan to develop the vacant land east of the Mall into an auto dealership and business complex.

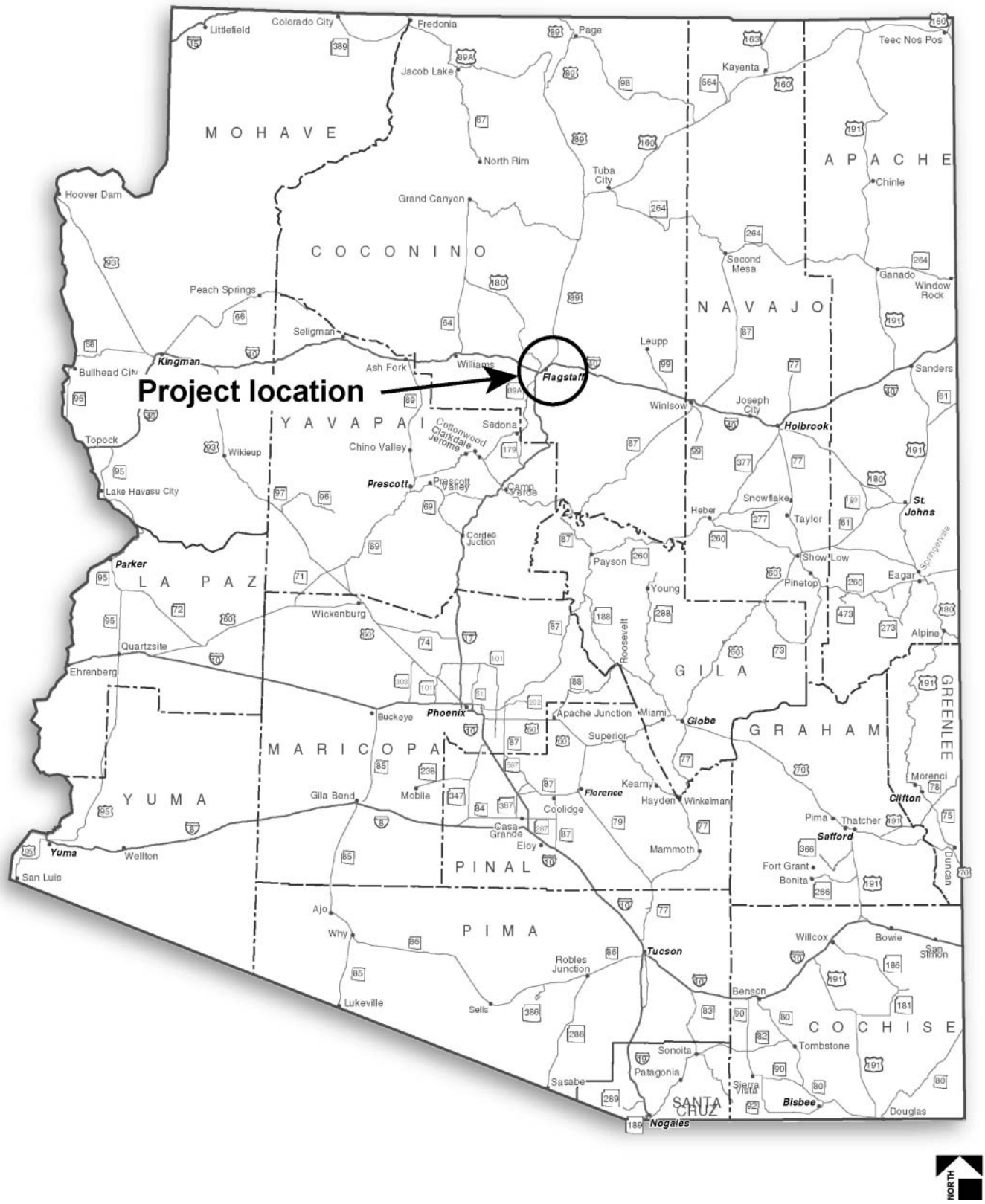


Figure 1. State map

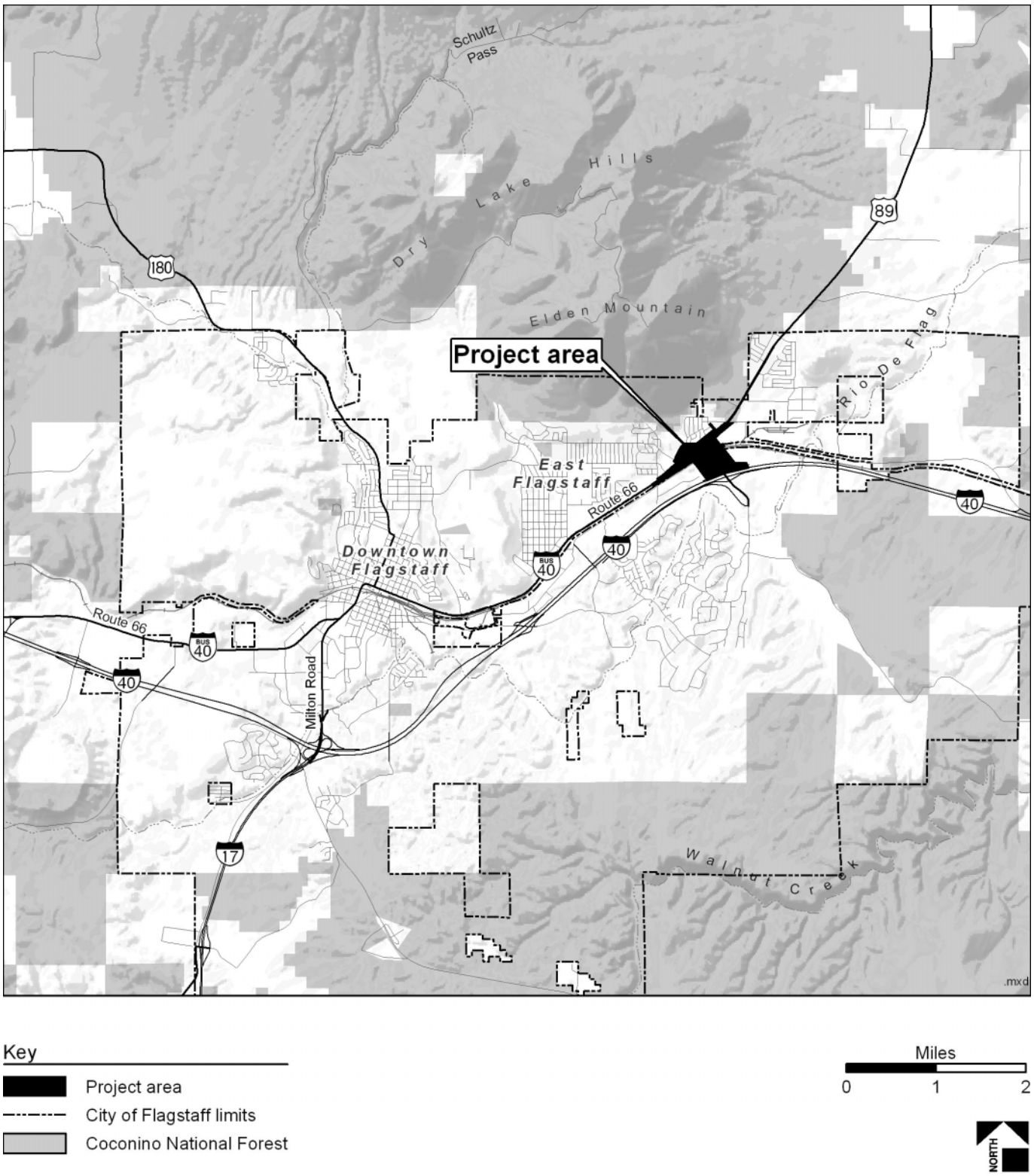
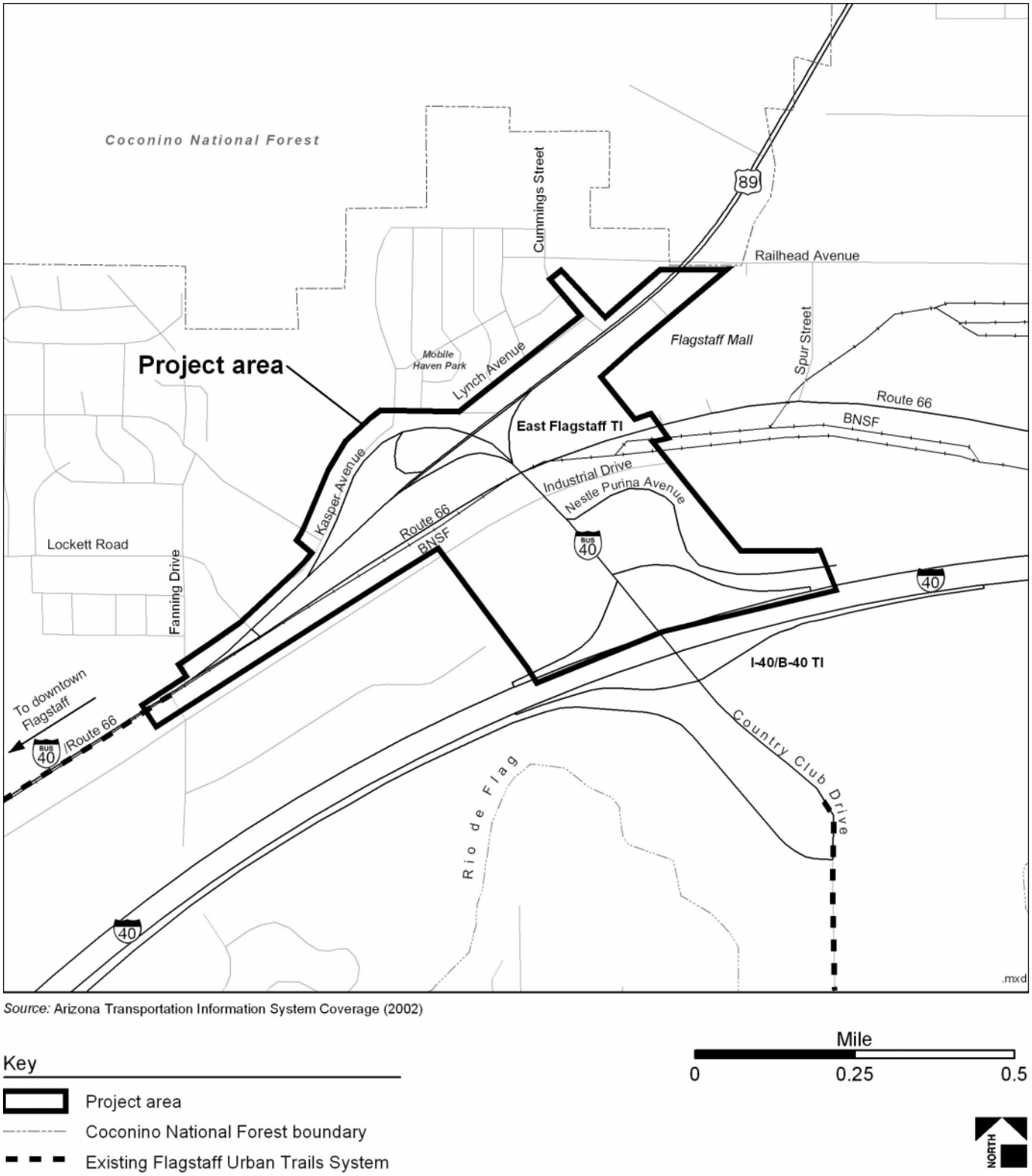


Figure 2. Vicinity map



Source: Arizona Transportation Information System Coverage (2002)

Key

- Project area
- Coconino National Forest boundary
- Existing Flagstaff Urban Trails System

Mile

0 0.25 0.5

NORTH

Figure 3. Project area

The East Flagstaff TI accommodates large volumes of regional and local traffic, including commuters to and from downtown Flagstaff.

ADOT, in conjunction with FHWA, the City of Flagstaff, Coconino County, and the Flagstaff Metropolitan Planning Organization has identified the need to improve pedestrian movement and drainage as well as traffic movement on and operation of the East Flagstaff TI. A Design Concept Report (DCR) that evaluated potential improvements to the TI was completed by ADOT in July 2002 (ADOT 2002a). A series of meetings was conducted with local and state agencies and the general public as part of the DCR. Based on input from the agencies and the community, the DCR recommended various roadway modifications to improve traffic movement and accommodate the projected increased traffic volumes at the TI. The DCR also assessed the addition of sidewalks and drainage system improvements to address local problems (e.g., local flooding during large storms and pedestrian movement). This EA evaluates the potential social, economic, and environmental impacts of proposed changes to the East Flagstaff TI based on information from the DCR, environmental studies, and the preliminary design plans.

According to the *Flagstaff Area Regional Land Use and Transportation Plan* (City of Flagstaff 2001) (*Regional Plan*), the City has pursued completion of a Flagstaff Urban Trails System (FUTS) since the mid-1980s. FUTS trails are planned as connections to and among employment centers, activity centers, neighborhoods, schools, and parks. An extension of a portion of the FUTS is recommended by the City of Flagstaff as part of the potential TI improvements. The City of Flagstaff applied for and received a federal Transportation Enhancement Grant to construct the portion of the FUTS within the East Flagstaff TI project area. The proposed construction of the FUTS is included in this EA.

D. Existing Conditions

The majority of US 89 within the project limits is a four-lane roadway (two southbound [SB] and two northbound [NB] lanes) with a raised median and paved shoulders. US 89 from east of the junction of the westbound (WB) B-40 ramp to the NB US 89 ramp is a five-lane roadway (two SB and three NB lanes) with a raised median and outside curb and gutter. The lane widths on US 89 vary from 11 to 12 feet. The inside shoulder is 2 feet and the outside paved shoulder width varies from 3 to 12 feet. US 89 ends where it merges with B-40 just north of Lockett Road. There are left-turn lanes at Fanning Drive, Cummings Street, the Flagstaff Mall entrance, and Railhead Avenue; lane widths vary from 10 to 12 feet. The Burlington and Northern Santa Fe Railway (BNSF) is parallel to and south of US 89.

B-40 is essentially a crossroad over I-40, the BNSF tracks, US 89, and Route 66 that splits into four one-lane ramps that connect to US 89/Route 66. B-40 in Flagstaff is also called Country Club Drive until it merges with Route 66; then the roadway is referred to as both Route 66 and B-40. Each ramp on B-40 has paved shoulders. The section of B-40 over US 89 and Route 66 is a two-lane roadway with 12-foot lanes and 8-foot outside shoulders. The B-40 ramp lane widths vary from 12 to 18 feet; inside shoulder widths are 2 feet and outside shoulders widths are 4 feet. The section of B-40 over the BNSF tracks has four 12-foot lanes, 2-foot-wide inside shoulders with a raised median, and 4-foot-wide outside shoulders. The existing B-40 bridge over the BNSF tracks was constructed in 1967 and is approximately 430 feet long, from abutment to abutment. Currently this bridge does not accommodate pedestrians or nonmotorized traffic and is deficient with respect to retention of integrity under seismic stress. Therefore, it is more cost effective to replace the bridge. US 66 is a two-lane roadway with 12-foot lanes with 8-foot paved shoulders.

The existing right-of-way (R/W) varies in the project area from 100 feet to 750 feet (at the TI). There are three traffic signals within the project area along US 89/B-40/Route 66: at the Mall Entrance, at Railhead Avenue, and at Fanning Drive. There are also several drainage facilities; corrugated metal pipe culverts under the BNSF tracks, B-40, and US 89; a concrete flume paralleling the WB B-40 to NB US 89 ramp; and concrete box culverts under Route 66 and between Lynch Road and US 89. In the project area, there is a sidewalk on the north side of Country Club Drive/B-40 that extends across the I-40 overpass and ends at the WB I-40 off-ramp. No sidewalks are present on the B-40 bridge over the BNSF tracks. There are also two segments of sidewalk on the north side of the roadway within the project area along US 89: between Cummings Street and Lynch Road and part way between Fanning Drive and Lockett Avenue. A continuous sidewalk system exists along US 89/Route 66 both north and south (north of Cummings Street and south of Fanning Drive) of the project site. Within the project area there is minimal vegetation; plant material is limited to the small stand of ponderosa pine trees between US 89 and the B-40 WB on-ramp area and a narrow band of trees and shrubs along the north side of US 89 just south of Cummings Street.

II. PROJECT PURPOSE AND NEED

A. Purpose and Need

The city of Flagstaff has seen an increasing numbers of visitors and a growing population over the past decade. Statistics for 1990 and 2000 indicate that Flagstaff has experienced a 13 percent increase in population, from 45,857 to 52,894 people; Coconino County has experienced a 20 percent population increase (96,591 to 116,320 people) over the same period (US Department of Commerce, Bureau of the Census 2000). According to the *Regional Plan* (Flagstaff 2001), the Flagstaff region is expected to increase to 104,000 people by 2020.

Currently, B-40 and US 89 each carry large volumes of regional and local traffic. The majority of regional traffic uses I-40/B-40/US 89 to travel to and from northern Arizona and Utah. All streets and roadways in the project area are expected to experience growth in traffic volumes and congestion between now and 2025 (ADOT 2004a), partially because of expansion of the Flagstaff Mall, the anticipated commercial growth with the development of an auto dealership complex east of the Mall, and because of anticipated residential growth in the area. According to the *Regional Plan* (Flagstaff 2001), residential and commercial development around the East Flagstaff TI is expected to increase in the next few years. This additional development will add substantially more traffic to US 89 and B-40 in the project area, exacerbating the existing congestion and traffic problems and likely creating new traffic issues.

Along with the projected increased traffic volumes along US 89 and B-40 is a corresponding decline in the level of service (LOS). LOS is a qualitative measure referring to the degree of congestion or delay experienced by motorists. According to the *Highway Capacity Manual*, LOS is measured when the morning (a.m.) and evening (p.m.) traffic volumes are at their highest (Transportation Research Board 2000). Levels of service range from A to F, with A being the best quality of traffic flow and F being the poorest (Figure 4). The *East Flagstaff Traffic Interchange Final Design Concept Report* (ADOT 2002a) analyzed traffic volumes for B-40 and US 89 to determine the existing LOS. Operational analyses were conducted for the projected 2025 (the design year) traffic volumes for the No Action and Build Alternatives outlined in the *Draft Traffic Report East Flagstaff Traffic Interchange* (ADOT 2004a) (Table 1). ADOT recommends a LOS D for traffic operating along US 89.

When the US 89/B-40 traffic interchange was originally constructed, all three legs of the interchange were free-flow (Figure 3). Currently, all three legs of the traffic interchange have traffic signals near the ramps. According to the *Highway Capacity Manual* (Transportation Research Board 2000), the operational effects

Level of Service A

Level of Service D

Level of Service B

Level of Service E

Level of Service C

Level of Service F

Source: Highway Capacity Manual Special Report 209, Transportation Research Board 1994, National Research Council

Figure 4. Level of service classifications

Table 1. 2003 and projected 2025 No Action and Build Alternative levels of service

Locations	2003 level of service		2025 level of service (No Action Alternative)		2025 level of service (Build Alternative)	
	a.m.	p.m.	a.m.	p.m.	a.m.	p.m.
US 89 near Fanning Drive	D	D	F	F	D	D
US 89 near Cummings Street	D	E	D	E	D	D
B-40 near Nestle Purina Avenue	D	D	E	F	D	D

Source: ADOT 2004a

of merging and diverging vehicles are the highest within 1,500 feet of the ramps. The existing ramp connecting WB B-40 to NB US 89 ends approximately 1,000 feet from the first major four-legged intersection (the Flagstaff Mall entrance) and 500 feet from the first intersection (Cummings Street). The existing ramp connecting WB B-40 to SB US 89/Route 66 ends approximately 1,300 feet from the first major four-legged intersection (Fanning Drive) and 700 feet from the first intersection (Lockett Road). The inadequate spacing and location of access points along US 89 in the vicinity of the ramps permit only short distances for traffic to merge onto US 89, causing traffic congestion and back-ups. For a developed urban area such as Flagstaff, the *Access Management Manual* (Transportation Research Board 2003) recommends a minimum of 750 feet between TI ramps and the first right-in, right-out driveway; a minimum of 2,640 feet to the first major four-legged intersection; and a minimum of 990 feet to the first median opening. The *Access Management Manual* also recommends that free-flow ramps not be used in urban areas because of the difficulties and dangers they pose for pedestrians and bicyclists.

The industrial and commercial businesses within the area of the TI generate heavy truck traffic to and from B-40 and Industrial Drive. The mix of car and truck traffic exiting along B-40 from the two free-flowing ramps providing access to US 89 causes difficult truck movements because of the insufficient frequency and duration of gaps in traffic along US 89.

Cummings Street provides the primary access to residential development north of the TI and to the Christensen Elementary School. Currently, there is no traffic signal at this intersection, and the high volume of traffic on US 89 does not readily provide breaks in the traffic flow for motorists turning onto US 89 from Cummings Street. Motorists traveling along Cummings Street currently experience high delays; this problem is projected to increase in the future because of the continued high volume of traffic along the roadway. There is a traffic signal at the Flagstaff Mall entrance just to the north of Cummings Street and also one at Railhead Avenue. The traffic signals at the Mall entrance and Railhead Avenue are too close together to facilitate the flow of traffic. Relocating the Mall entrance to Cummings Street would address access issues from Cummings Street and provide greater distance between the two traffic signals for improved traffic movement.

The residential neighborhoods south of I-40 along Country Club Drive and southwest of the US 89/B-40 TI are generators of pedestrian traffic going to and from the Flagstaff Mall. The sidewalk system along B-40 (County Club Drive) from I-40 to US 89 is noncontinuous, and no sidewalks are present on the structure over the BNSF tracks. The US 89 ramps do not allow for pedestrian and bicycle movement along US 89 and B-40. Currently, pedestrians cross the BNSF tracks at various unauthorized at-grade locations. The sidewalk system along US 89 is also noncontinuous and does not provide a connection to the existing system south of Fanning Drive and north of Cummings Street.

Flagstaff citizens were provided the opportunity to participate in a wide-ranging discussion about the future course of their city to 2020 and developed *A Vision for Our Community—Flagstaff 2020* (City of Flagstaff 1997) (*Flagstaff 2020*). Citizens involved in the *Flagstaff 2020* process placed considerable emphasis on the greater Flagstaff area becoming more pedestrian-oriented. In addition, the community would benefit from an off-street designated path separating pedestrian/bicycle traffic from the approximately 25,000 to 35,000 vehicles per day that currently use US 89. A trail along US 89, B-40, and US 66 would connect to the existing FUTS and would provide improved access for pedestrians/bicyclists through the project area to the Mall.

The existing B-40 bridge over the BNSF tracks was built in 1967 and has been determined to be deficient with respect to retaining its integrity under seismic stress. This structure is not in conformance with the current seismic code for structures located in a Seismic Performance Category C[1] area. In addition, the existing bridge would require widening to accommodate traffic and pedestrian demands.

The project area lies within the Mount Elden watershed, with stormwater runoff flowing generally north to south, eventually into the Rio de Flag approximately 1 mile from the East Flagstaff TI. Stormwater is conveyed under B-40, US 89, Route 66, and the BNSF tracks through pipes and box culverts. Currently, there is a local drainage problem created by the inadequate capacity of the culverts to pass both off-site and on-site stormwater beneath the roadways and the BNSF tracks. With a 50-year or greater storm, this results in flooding of US 89 and ponding of water on the north side of the BNSF tracks within the project area.

In summary, the need to improve the East Flagstaff TI has developed from increased traffic volumes that have produced greater operational and capacity demands. These conditions are projected to continue and,

[1] American Association of State Highway and Transportation Officials (AASHTO) publishes the 2002 *Standard Specifications for Highway Bridges*. One of four seismic performance categories classifies each bridge, A through D. Category A does not require any seismic design while Category D requires the most stringent seismic design. Based on the AASHTO requirements, this location is within Category C.

therefore, exacerbate the current situation. The current roadway also has inadequate spacing between ramps and access points. Projected travel congestion is expected to impede the flow of traffic on the roadway. Localized flooding of US 89 will continue, which would further reduce traffic flow if the local drainage problem is not alleviated. Additionally, extension of the FUTS into the project area and continuous sidewalks would provide improved access for pedestrians and bicyclists through the project area and to and from the Flagstaff Mall. The purpose of the proposed improvements is to reduce traffic congestion, alleviate back-ups, improve local drainage, ensure that all structures meet seismic resistance requirements, and enhance pedestrian and nonmotorized transportation.

The proposed improvements would comply with current ADOT and American Association of State Highway and Transportation Officials (AASHTO) (AASHTO 1999) design criteria/guidelines and accommodate the traffic volumes for design year 2025.

ADOT has undertaken this EA to evaluate the potential environmental and socioeconomic impacts associated with proposed actions to improve the East Flagstaff TI. ADOT has evaluated in detail preliminary alternative TI improvements to alleviate congestion and reduce traffic conflicts. The DCR evaluated existing conditions and projected future service needs extending to design year 2025. To meet the transportation needs of the public, ADOT has determined that the ultimate built facility for the East Flagstaff TI should accommodate additional traffic lanes on US 89 and B-40, provide for continuous sidewalks, and improve local drainage.

B. Conformance with Regulations, Land Use Plans, and Other Plans

The proposed project would comply with the *Regional Plan* (Flagstaff 2001). A goal of the *Regional Plan* is to "provide access for pedestrians and bicyclists and develop an enhanced road system for good traffic flow." It also encourages development of a multimodal transportation system that balances mobility across all of the modes of transportation and gives citizens a greater range of alternative means of travel.

The proposed project would comply with *Flagstaff 2020* along with ADOT and AASHTO design criteria and guidelines.

C. General Project Schedule

This project is listed in ADOT's *2005–2009, Five-Year Transportation Facilities Construction Program* for construction in fiscal year 2006. Construction of the TI would require it to be built in phases to provide for

construction of the new B-40 overpass structure while maintaining traffic on existing roads to the extent possible. Construction is anticipated to last two seasons, from July 2005 to November 2005 and from March 2006 to November 2006.

D. Issues Eliminated From Detailed Study

The following environmental resources were eliminated from further evaluation after it was determined that either the resources did not occur within the project area or did not apply to this specific geographic location. The proposed improvements would not impact the following: designated critical habitat, ground water, sole source aquifers, prime and unique farmlands, wild and scenic rivers, wetlands, riparian areas, farmlands, or National Natural Landmarks.

III. ALTERNATIVES

In considering improvements to I-40 and the East Flagstaff TI, alternatives were developed and evaluated. Two alternatives (I-40-E and I-40-W) involving major improvements to I-40 were considered but eliminated from further study. Ten alternatives for improvements to the East Flagstaff TI (Alternatives 1, 2, 3, 4, 4A, 5, 5A [the Preferred Alternative], 6, 7, and 8) and the No Action Alternative were considered for further study. These alternatives are described below.

A. Alternatives Considered but Eliminated from Further Study

Interstate 40. Two alternatives were developed to separate the regional traffic from local traffic using B-40. Alternatives I-40-E and I-40-W both involve major revisions to I-40 access. Alternative I-40-E would construct a split traffic interchange at the existing TI, with the east half built approximately 0.25 mile east of its current location and the existing east ramps relocated to this new location. In addition, a four-lane roadway with raised median would be constructed from I-40 around the east side of the Flagstaff Mall to connect with US 89 approximately 0.5 mile north of Railhead Avenue. Alternative I-40-W would construct new ramps on I-40 approximately 0.5 mile west of the East Flagstaff TI and a four-lane roadway from I-40 north to connect with US 89 just west of the B-40 overpass. These two alternatives were eliminated from further study because of issues associated with construction of major structures over I-40, the BNSF tracks, Route 66, and Railhead Avenue; substantial amount of new roadways needed to connect the new facilities to the existing facilities; short weaving and merging distances (i.e., insufficient distance for vehicles to maneuver between access points); major revisions to I-40 access; and impacts to the Mall expansion. Additionally, with each of these alternatives, modifications to the East Flagstaff TI would still be required.

B. Alternatives Considered for Further Study

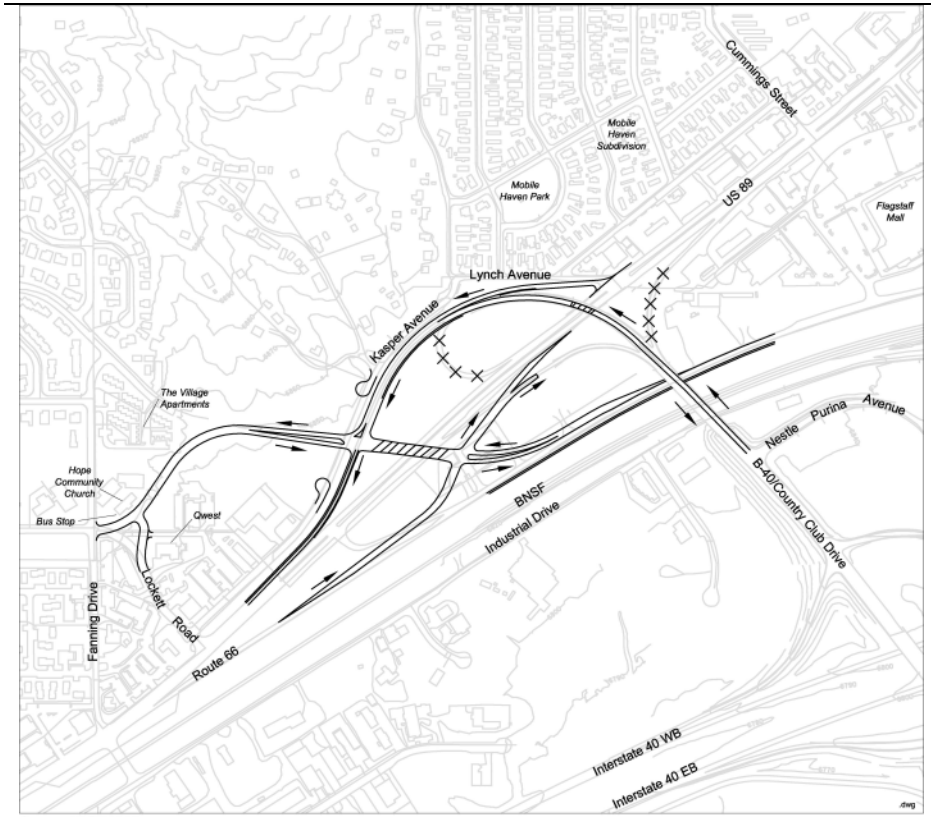
1. No Action Alternative

Under the No Action Alternative US 89, B-40, and Route 66 would remain in their present conditions. The No Action Alternative would allow for minor improvements, routine maintenance, and pavement resurfacing. This alternative provides no major improvements for US 89 or the intersections of US 89 and B-40 or US 89 and Route 66.

2. East Flagstaff TI

A total of ten build alternatives were developed and evaluated for improvements to the East Flagstaff TI. Tables 2 through 10 describe each of these alternatives and the engineering and environmental considerations associated with each. The R/W, visual, property, and business impacts associated with potential drainage solutions were not identified for these alternatives.

Table 2. Alternative 1



Description: Compact diamond interchange[2] with a realigned Route 66 and Lockett Road serving as a crossroad. New ramps would connect US 89 and B-40 to the TI, and new bridges would allow B-40 and the new crossroad to pass over US 89. Kasper Avenue would be terminated (see culs-de-sac) on either side of the new Route 66/Lockett Road crossroad. US 89 would remain at its existing elevation.

Engineering/Operational Considerations

- SB US 89 traffic would exit at Lynch Avenue and would require out-of-direction travel to get to B-40/I-40
- WB B-40 traffic would require out-of-direction travel to get to NB US 89
- Vehicles would have insufficient distance to merge onto SB US 89 approaching Lockett Road and Fanning Drive
- Uses ramps that would require merging in areas with driveways and intersections
- Complicated traffic interchange layout
- Allows for a lower volume of storage for stormwater than Alternatives 5, 5A, and 8

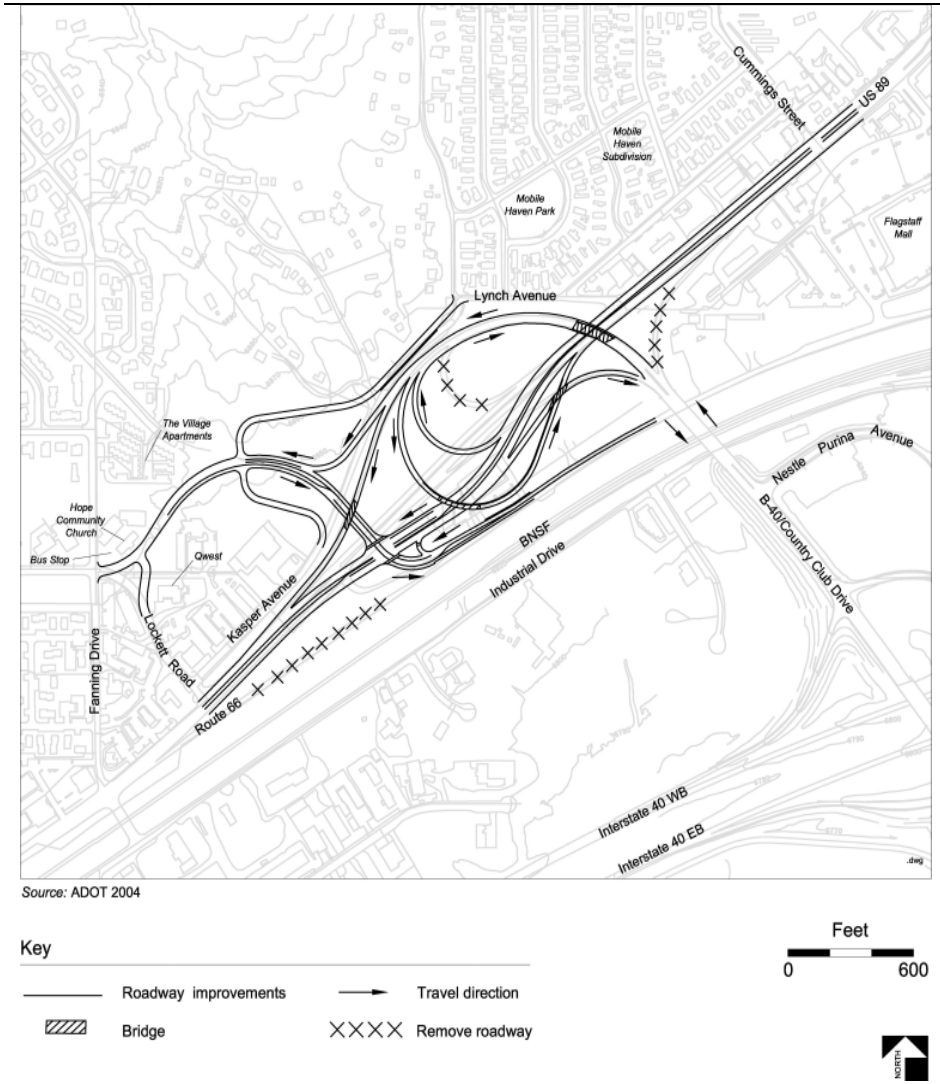
Environmental Considerations

- Potential take from 9 property owners
- Potential impacts to 13 businesses and 1 church
- Culs-de-sac at Kasper Avenue would interrupt local motorists' continuity
- Potential impacts to 3 watercourses under the jurisdiction of COE[a]
- Potential increase in noise levels for sensitive receivers at Mobile Haven Subdivision, Hope Community Church, and The Village Apartments
- Potential increase in cut-through traffic through residential area along Lockett Road west of Fanning Drive
- Potential relocation of 1 Mountain Line bus stop on Lockett Road
- Notable change from existing visual character because of expanded footprint of the TI and two new bridges over US 89
- Pedestrian movement less direct than Alternatives 4, 4A, 5, 5A, 6, 7, and 8, and potential for vehicular conflicts with presence of free-flowing ramps

[a] COE – US Army Corps of Engineers

[2] Compact diamond interchanges are characterized by ramps that orient in essentially the same direction as the main roadway. Four ramps provide for all eight turning movements to and from a crossroad. A diamond interchange typically has two intersections between the ramps and the crossroad. A compact diamond interchange has ramp intersections with the crossroad that are fairly close together—typically separated by roughly 300 to 500 feet. This interchange configuration is similar to the interchanges at I-40/Country Club Drive.

Table 3. Alternative 2



Description: A semidirectional interchange. New loop ramps would connect US 89 and B-40; bridges would allow B-40 to cross over US 89. Route 66 and Lockett Road would be realigned to construct a new interchange. Kasper Avenue and US 89 would be realigned to the northwest and southeast, respectively. US 89 would remain at its existing elevation.

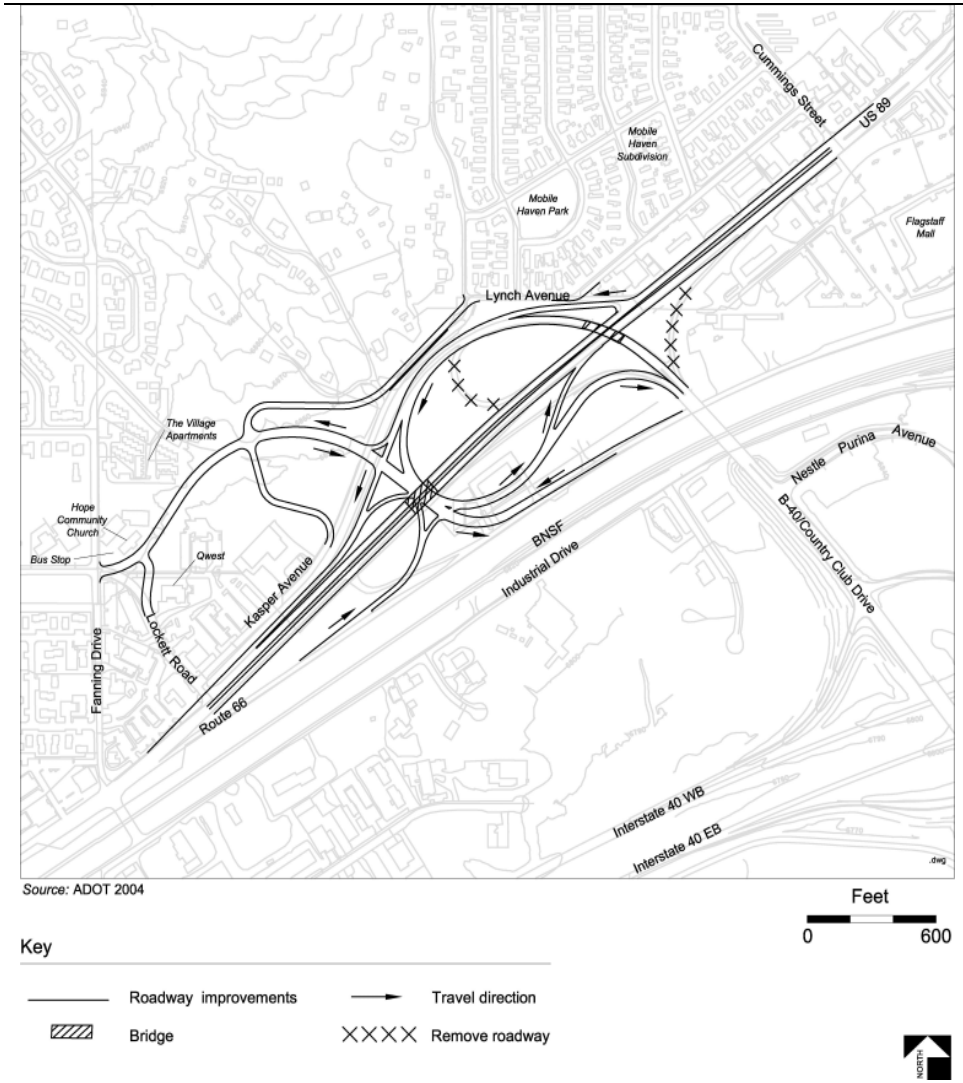
Engineering/Operational Considerations

- Construction of 4 new bridges would make it difficult to maintain traffic during construction
- The alignment of US 89 would result in a skewed connection at Route 66/US 89
- Insufficient merge distances
- Constructability difficulties
- High-volume regional traffic movement (SB US 89 to [eastbound] EB B-40/I-40 and WB B-40 to NB US 89) would require out-of-direction travel
- Uses ramps that would require merging in areas with driveways and intersections
- Insufficient distance between successive exit ramps
- Complicated traffic interchange layout
- Allows for a lower volume of storage for stormwater than Alternatives 5, 5A, and 8

Environmental Considerations

- Potential take from 15 property owners
- Potential impacts to 19 businesses and 1 church
- Potential impacts to 3 watercourses under the jurisdiction of COE
- Potential increase in noise levels for sensitive receivers at Mobile Haven Subdivision, Hope Community Church, and The Village Apartments
- Highest cost of all build alternatives
- Potential increase in cut-through traffic through residential area along Lockett Road west of Fanning Drive
- Potential relocation of 1 Mountain Line bus stop on Lockett Road
- Substantial change from existing visual character from larger footprint and multiple elevated structures
- Pedestrian movement less direct than Alternatives 4, 4A, 5, 5A, 6, 7, and 8, and potential for vehicular conflicts with presence of free-flowing ramps

Table 4. Alternative 3



Description: Single-point urban TI[3] with Route 66 and Lockett Road realigned and serving as a crossroad. New ramps would connect US 89 and B-40 to the TI. New bridges would allow B-40 to cross over US 89, and US 89 to cross over the new crossroad. Kasper Avenue would be realigned to the northwest.

Engineering/Operational Considerations

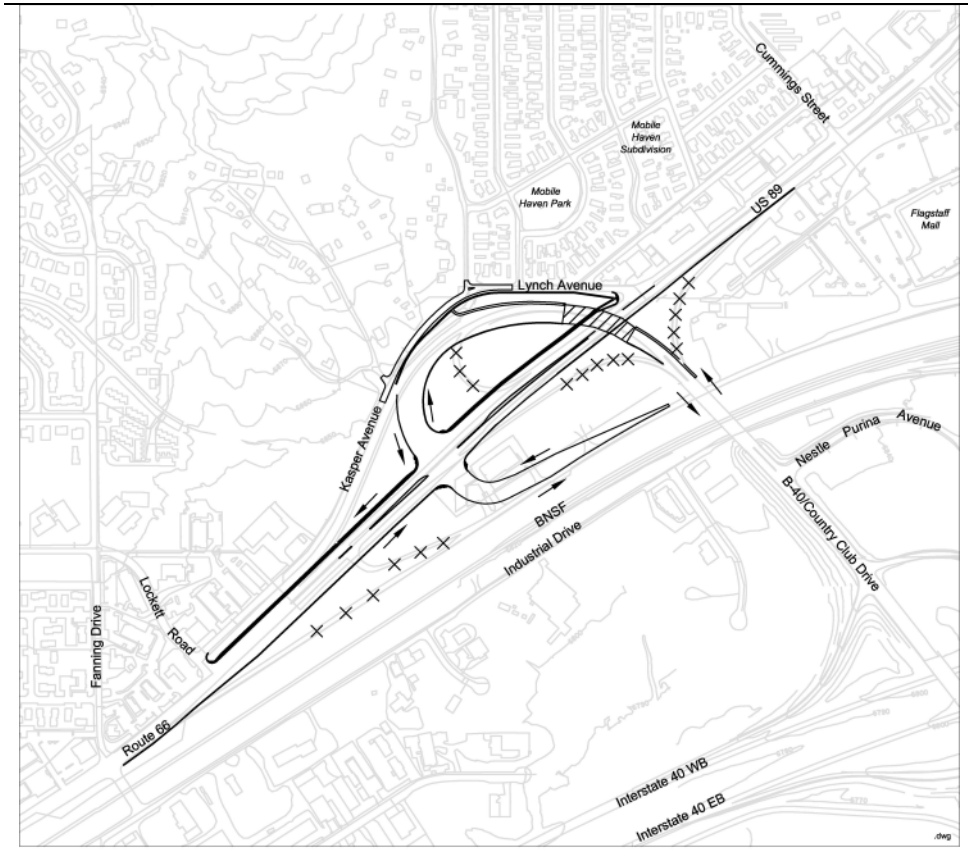
- Because of the proximity of the intersection to existing Route 66, US 89 would be elevated at the interchange
- Insufficient merging distances
- High-volume regional traffic movement (SB US 89 to EB B-40/I-40 and WB B-40 to NB US 89) would require out-of-direction travel
- Multiple driver-decision points
- Constructability difficulties
- Uses ramps that would require merging in areas with driveways and intersections
- Complicated traffic interchange layout
- Allows for a lower volume of storage for stormwater than Alternatives 5, 5A, and 8

Environmental Considerations

- Potential take from 15 property owners
- Potential impacts to 19 businesses and 1 church
- Potential impacts to 3 watercourses under the jurisdiction of COE
- Potential increase in noise levels for sensitive receivers at Mobile Haven Subdivision, Hope Community Church, and The Village Apartments
- Potential increase in cut-through traffic through residential area along Lockett Road west of Fanning Drive
- Potential relocation of 1 Mountain Line bus stop on Lockett Road
- Substantial change from existing visual character because of larger TI footprint and multiple elevated structures
- Pedestrian movement less direct than Alternatives 4, 4A, 5, 5A, 6, 7, and 8, and potential for vehicular conflicts with presence of free-flowing ramps

[3] A single point urban interchange is similar to a diamond interchange in that four ramps provide for all movements to and from a crossroad. This interchange type shifts the intersections of the ramps and crossroad toward the center of the interchange. A single-point urban interchange configuration results in one intersection near the center of the interchange.

Table 5. Alternative 4



Description: At-grade interchange between US 89, B-40, and Route 66; a new bridge would allow B-40 to pass over US 89 and connect to the interchange. Kasper Avenue would be slightly realigned to the northwest. US 89 would remain at its existing elevation.

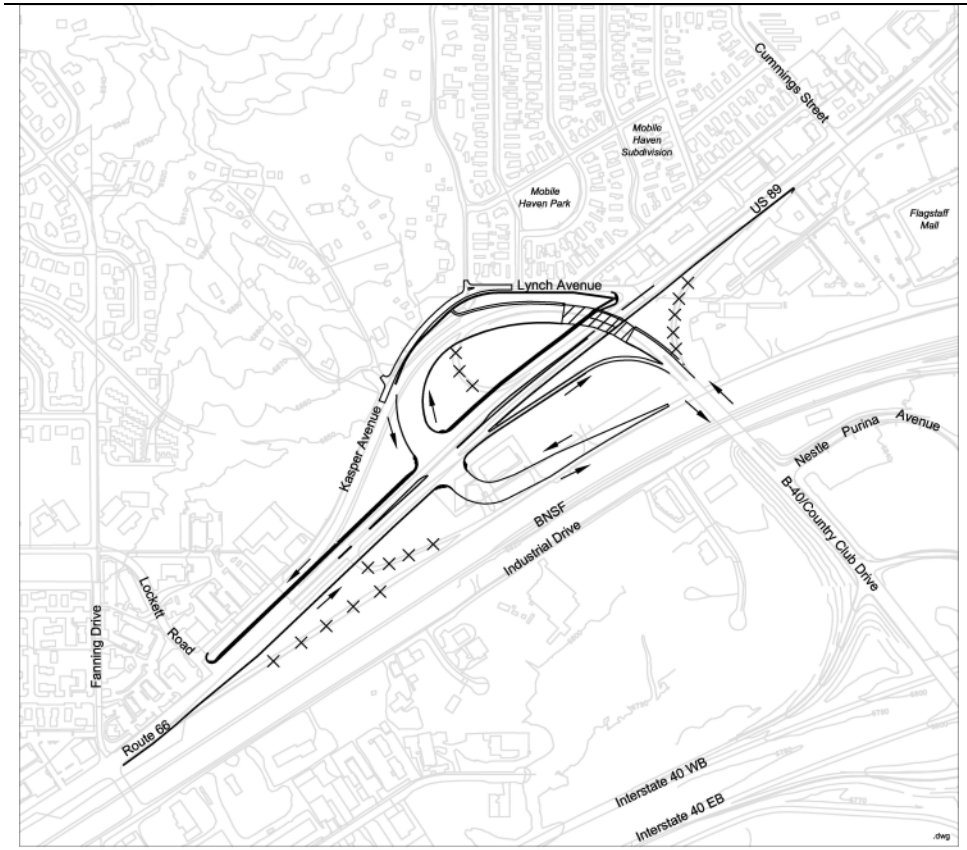
Engineering/Operational Considerations

- All turning movements between B-40 and US 89 would be through the at-grade signalized intersection
- Requires triple left-turn lanes at US 89/B-40 interchange
- Creates intersection/signal visibility issues on B-40 approaching US 89
- Could increase accident potential because of the number of left-turn movements required at the US 89/B-40 interchange
- WB B-40 traffic would require out-of-direction travel to gain access to NB US 89
- SB US 89 traffic would require out-of-direction travel to gain access to B-40/I-40
- Allows for a lower volume of storage for stormwater than Alternatives 5, 5A, and 8

Environmental Considerations

- Potential take from 5 property owners
- Potential impacts to 12 businesses
- Potential impacts to 2 watercourses under the jurisdiction of COE
- Potential substantial increase in noise levels for Mobile Haven Subdivision
- Local motorists' continuity and general traffic pattern maintained on Lynch and Kasper Avenues and Lockett Road
- Notable change in existing visual character from the construction of 20-foot-high retaining walls parallel to Kasper Avenue near the US 89/B-40 interchange
- Pedestrian movement less direct than Alternatives 5, 5A, and 8, and potential for vehicular conflicts at the at-grade interchange of US 89/ B-40

Table 6. Alternative 4A



Description: At-grade interchange between US 89, B-40, and Route 66. This Alternative is similar to Alternative 4, but the existing ramp connecting northbound US 89 to B-40 would remain in service. A new bridge would allow B-40 to pass over US 89 and connect to the new interchange. Kasper Avenue would be slightly realigned to the northwest and US 89 would remain at its existing elevation.

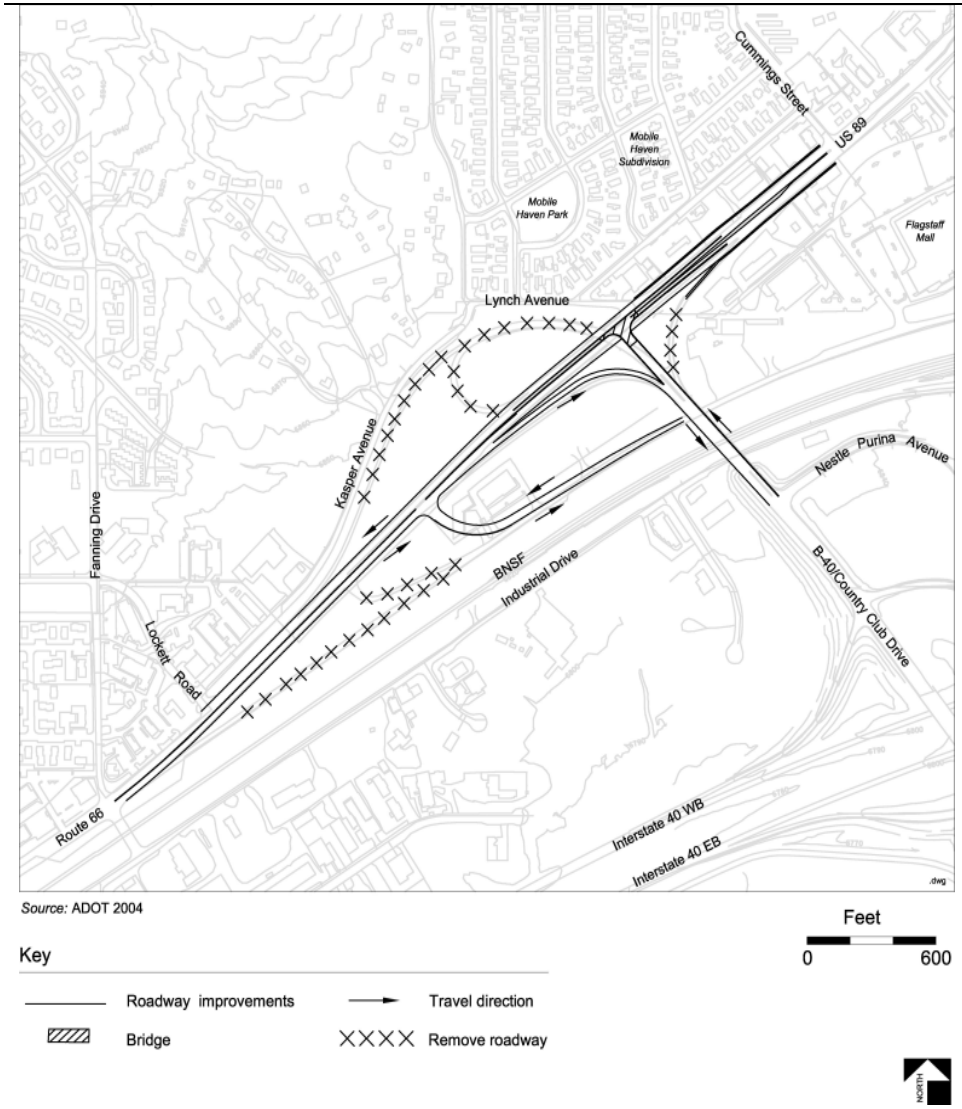
Engineering/Operational Considerations

- All turning movements between B-40 and US 89 would be through the at-grade, signalized intersection
- Creates intersection/signal visibility issues on B-40 approaching US 89
- Triple left-turn lanes required for WB B-40 to NB US 89 traffic
- SB US 89 traffic would require out of direction travel to gain access to NB B-40/I-40
- WB B-40 traffic would require out-of-direction travel to gain access to NB US 89
- Allows for a lower volume of storage for stormwater than Alternatives 5, 5A, and 8

Environmental Considerations

- Potential take from 5 property owners
- Potential impacts to 12 businesses
- Potential impacts to 2 watercourses under the jurisdiction of COE
- Potential substantial increase in noise levels for Mobile Haven Subdivision
- Local motorists' continuity and general traffic pattern maintained on Lynch and Kasper Avenues and Lockett Road
- Pedestrian movement less direct than Alternatives 5, 5A, and 8, and potential for vehicular conflicts at the at-grade interchange of US 89/ B-40

Table 7. Alternative 5



Description: An elevated US 89/B-40 intersection and a new at-grade intersection between US 89 and Route 66. New ramps would allow US 89 traffic to gain access to the new intersection with B-40; a new bridge would allow B-40 to pass over the northbound US 89 travel lanes. Retaining walls would be required in the US 89 median to separate the new ramps from US 89.

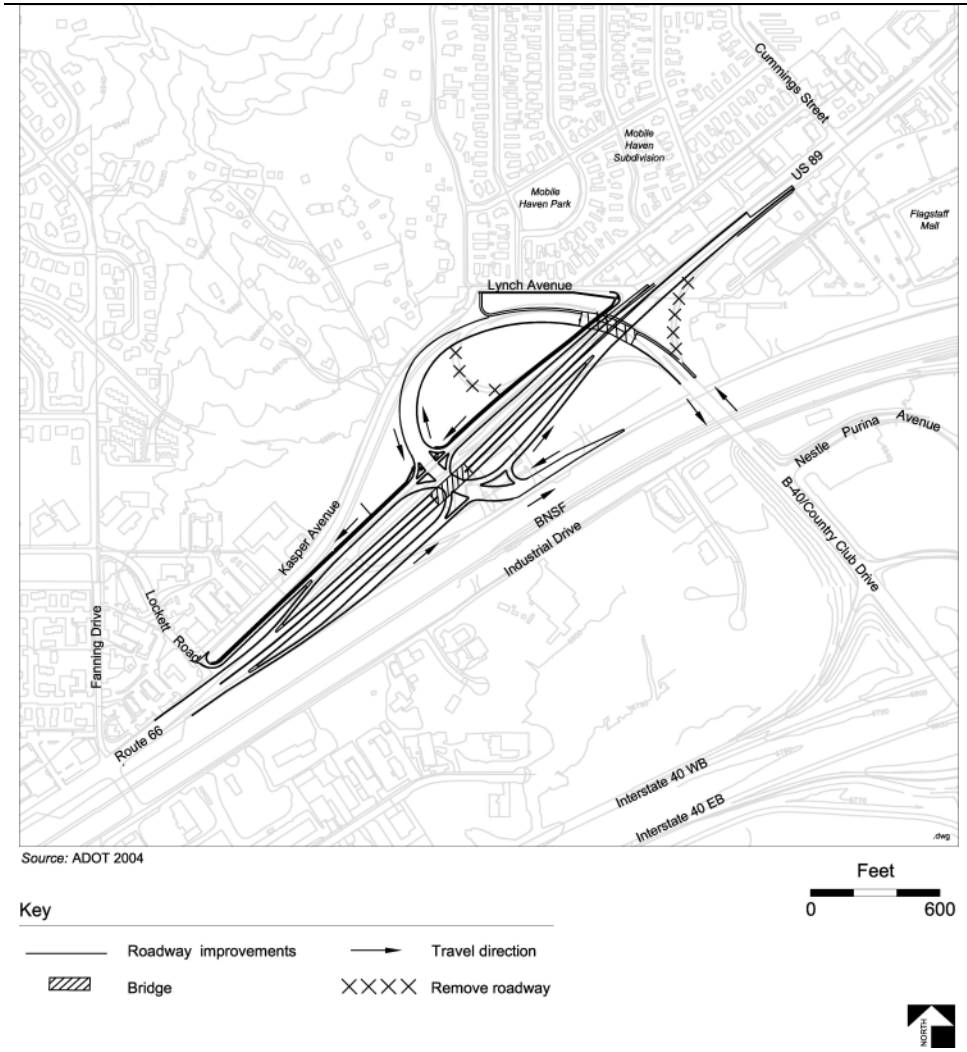
Engineering/Operational Considerations

- A substantial number of retaining walls (20 to 25 feet in height) would be required to separate the ramps from US 89 near the intersection
- Steep grades on ramps
- Constructability problems
- Insufficient merge distances
- Difficult for traffic to access Flagstaff Mall entrance from B-40
- Few motorists' decision points
- Difficult for SB US 89 traffic to gain access to US 66
- Uses ramps that would require merging in areas with driveways and intersections
- Allows for a higher volume of storage for stormwater than Alternatives 1, 2, 3, 4, 4A, 6, and 7

Environmental Considerations

- Potential take from 12 property owners
- Potential impacts to 22 businesses
- Potential impacts to 2 watercourses under the jurisdiction of COE
- Less potential increase in noise levels for sensitive receivers at Mobile Haven Subdivision than Alternatives 1, 2, 3, and 7
- Substantial change from existing visual character because of retaining walls along US 89
- Pedestrian and bicycle movement is more direct than with Alternatives 1, 2, 3, 4, 4A, 6, and 7. Provides greater pedestrian/bicycle separation from roadway traffic

Table 8. Alternative 6



Description: A combination of Alternatives 3 and 4; would construct a single-point urban TI[4] with B-40 and a connector to Route 66 as the crossroad. US 89 would be realigned to the south to provide staged construction to maintain traffic during construction. The realigned segment of US 89 would be elevated over a new B-40/Route 66 crossroad. Lockett Road would not have direct connection to US 89.

Engineering/Operational Considerations

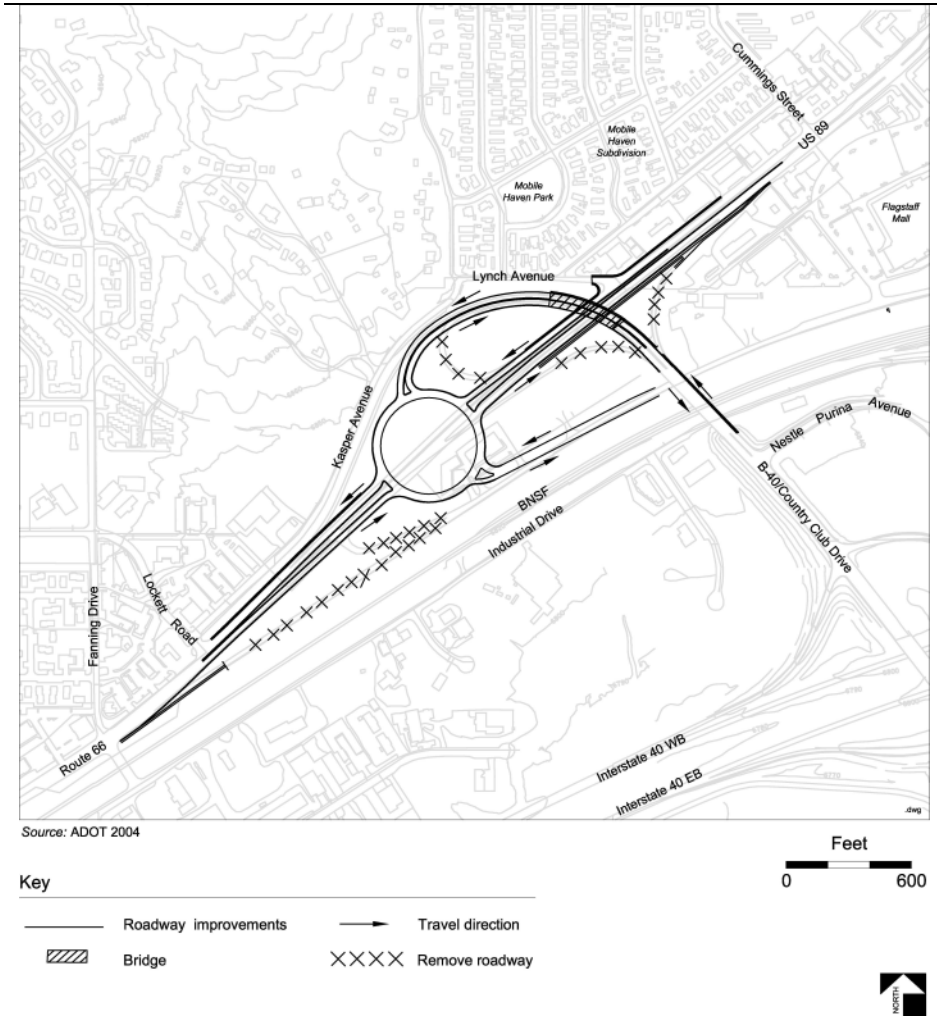
- Lockett Road traffic would not directly be able to gain access to US 89
- Creates intersection/signal-visibility issues on B-40 approaching US 89
- Undesirable roadway curvature
- Uses ramps that would require merging in areas with driveways and intersections
- Complicated interchange layout
- WB B-40 traffic would require out-of-direction travel to gain access to NB US 89
- Allows for a lower volume of storage for stormwater than Alternatives 5, 5A, and 8

Environmental Considerations

- Potential take from 9 property owners
- Potential impact to 18 businesses
- Potential impacts to 3 watercourses under the jurisdiction of COE
- Potential substantial increase in noise levels for Mobile Haven Subdivision
- Substantial change in existing visual character because of new additional bridges and greater TI footprint
- Pedestrian movement less direct than Alternatives 5, 5A, and 8, and potential for vehicular conflicts at the at-grade interchange of US 89/B-40

[4] A single-point urban interchange is similar to a diamond interchange in that four ramps provide for all movements to and from a crossroad. This interchange type shifts the intersections of the ramps and crossroad toward the center of the interchange. A single-point urban interchange configuration results in one intersection near the center of the interchange.

Table 9. Alternative 7



Description: An at-grade traffic circle for US 89, B-40, and Route 66. A new bridge would allow B-40 to pass over US 89 and connect to the new traffic circle. Route 66 would be realigned to connect to the new traffic circle. US 89 would remain at its existing elevation.

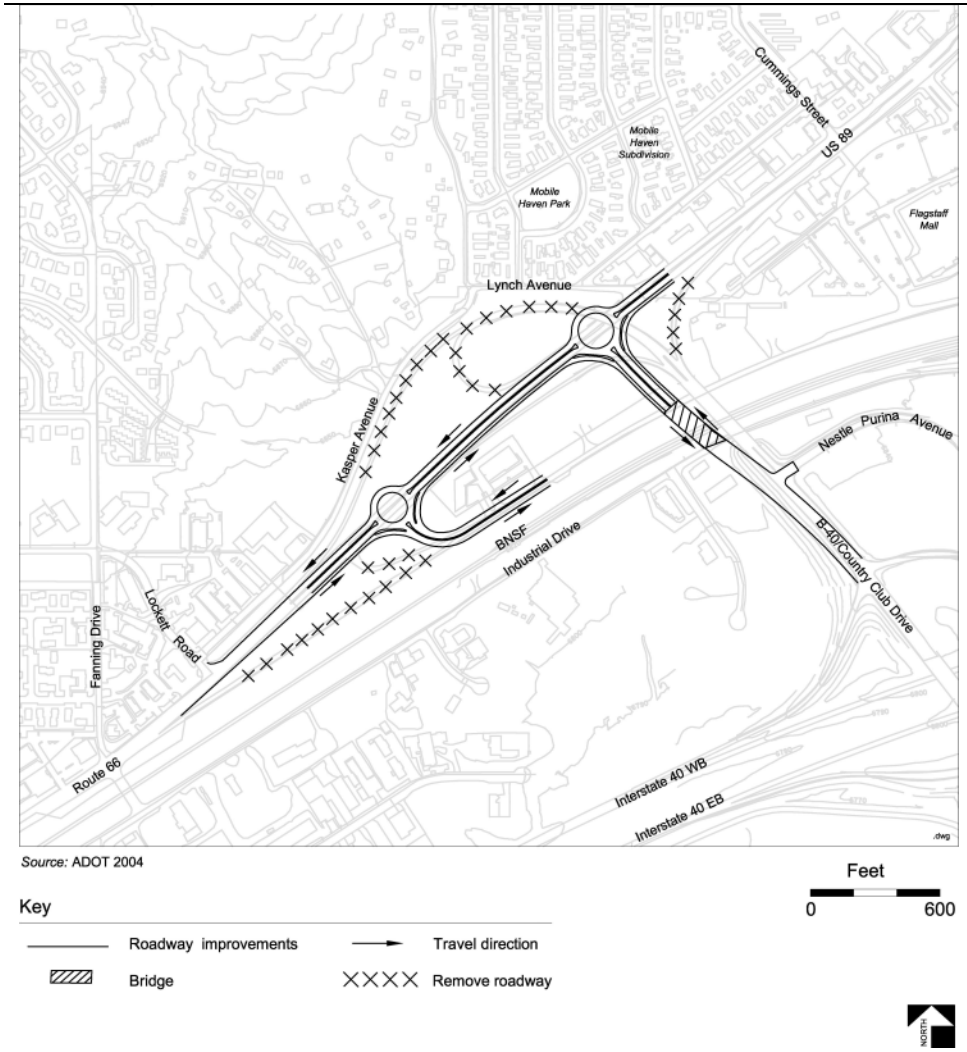
Engineering/Operational Considerations

- Operational problems because of high volumes of traffic through the circle and associated traffic signals
- Traffic on US 89 would experience delays
- Because this alternative would not use traffic signals to manage traffic flow, the free-flow of traffic around the circle could cause conflicts between vehicles and pedestrians/bicyclists who try to cross the road
- SB US 89 traffic requires out-of-direction travel to gain access to B-40/I-40
- WB B-40 traffic requires out-of-direction travel to gain access to NB US 89
- Allows for a lower volume of storage for stormwater than Alternatives 5, 5A, and 8

Environmental Considerations

- Potential take from 6 property owners
- Potential impacts to 13 businesses
- Potential impacts to 2 watercourses under the jurisdiction of COE
- Potential increase in noise levels for Mobile Haven Subdivision
- Local motorists' continuity and general traffic pattern maintained on Lynch and Kasper Avenues and Lockett Road
- Notable change in visual character because of the elevated structure over US 89 and footprint of traffic circle
- On-street pedestrian and bicyclists' mobility would be less desirable because of the free-flowing movement around the roundabouts and intersecting legs
- Pedestrian movement less direct than Alternatives 5, 5A, and 8, and potential for vehicular conflicts at traffic circle and intersecting legs

Table 10. Alternative 8



Description: Two new roundabouts would be constructed. This alternative is similar to Alternative 5A except with roundabouts as opposed to "T" intersections. B-40 would be widened to three lanes in each direction between US 89 and I-40, and a new bridge would be constructed over the BNSF tracks.

Engineering/Operational Considerations

- Operational problems because of high volumes of traffic through the roundabouts and associated signals
- Traffic on US 89 would experience delays
- Because this alternative would not use traffic signals to manage traffic flow, the free flow of traffic around the circle could cause conflicts between vehicles and pedestrians/bicyclists who try to cross the road
- Poor visibility of roundabout from B-40
- Improves B-40 traffic capacity
- Allows for a higher volume of storage for stormwater than Alternatives 1, 2, 3, 4, 4A, 6, and 7

Environmental Considerations

- Potential take from 4 property owners
- Potential impact to 5 businesses
- No potential impacts to watercourses under the jurisdiction of COE
- No notable increase in noise levels for Mobile Haven Subdivision
- Local motorists' continuity and general traffic pattern maintained on Lynch and Kasper Avenues and Lockett Road
- On-street pedestrian and bicyclists' mobility would be less desirable because of the free-flowing movement around the roundabouts and intersecting legs
- Pedestrian and bicycle movement is more direct than with Alternatives 1, 2, 3, 4, 4A, 6, and 7. Provides greater pedestrian/bicycle separation from roadway traffic

Alternatives 1, 2, and 3 were eliminated from further consideration because they include ramps that would have insufficient merging distances; create potential increases to noise levels for sensitive receivers at Mobile Haven Subdivision, Hope Community Church, and The Village Apartments (refer to *Section VI. H. Noise Analysis*); have constructability[5] issues; require out-of-direction travel for the high volume of regional traffic going from B-40 to NB US 89 and vice versa; and potentially increase cut-through traffic through an existing residential area along Lockett Road. Alternative 2 includes multiple exit ramps close to each other as WB B-40 traffic approaches US 66/Lockett Road. The proximity of these successive exit ramps does not conform with AASHTO recommendations and creates multiple driver-decision points; that is, because of the small separation between ramp locations, motorists would be required to quickly choose and maneuver into the desired lane. Additionally, Alternatives 2 and 3 would create a substantial change in the existing visual character of the setting because of the resultant large TI footprints and the high visibility of multiple, elevated structures. These two alternatives would potentially impact 19 businesses and 15 property owners, which would be more than all of the other build alternatives except Alternative 5, which would potentially impact 22 businesses and 12 property owners.

Alternative 4 was eliminated from further consideration because it would require triple left-turn lanes, create intersection and traffic signal visibility issues because of B-40's curved alignment approaching US 89, potentially increase the noise levels substantially for the residents in the Mobile Haven Subdivision, and potentially affect more businesses and property owners than would Alternative 5A. In addition, there could be an increase in the accident potential because of the number of left-turn movements required at the US 89/B-40 interchange with this alternative.

Alternative 4A was eliminated from further consideration because it would create intersection and traffic signal visibility issues at the B-40 curved alignment approaching US 89, potentially increase the noise levels substantially for residents of the Mobile Haven Subdivision, and potentially affect more businesses and property owners than Alternative 5A.

Alternative 5 was eliminated because of the cost of constructing a substantial number of retaining walls, steep grades on ramps, constructability issues, insufficient merging distances, and substantial change in the existing visual character of the project area because of the retaining walls.

[5] Constructability measures the degree of difficulty expected to be encountered in constructing and maintaining traffic through the work area. For example, an alternative with new roadways that overlap with existing roadways would be more difficult to construct than an alternative that does not overlap with existing roadways. With this project, there are not many feasible detours for US 89 and/or B-40, so constructability is an important issue.

Similar to Alternative 4A, Alternative 6 was eliminated from further consideration because of the US 89/B-40 interchange and traffic signal visibility issues, the potential to substantially increase noise levels to the residents in the Mobile Haven Subdivision, and the potential to affect more businesses than would Alternative 5A. Alternative 6 would include ramps that would require merging in an area with driveways and intersections and would create a substantial change in the existing visual character of the project area because of the new, elevated structures and large footprint of the TI.

Alternatives 7 and 8 were eliminated from further consideration because they would result in long queuing and excessive traffic delay because of the higher volume of traffic and backup of SB traffic on US 89 based on the estimated traffic volume by the design year 2025.

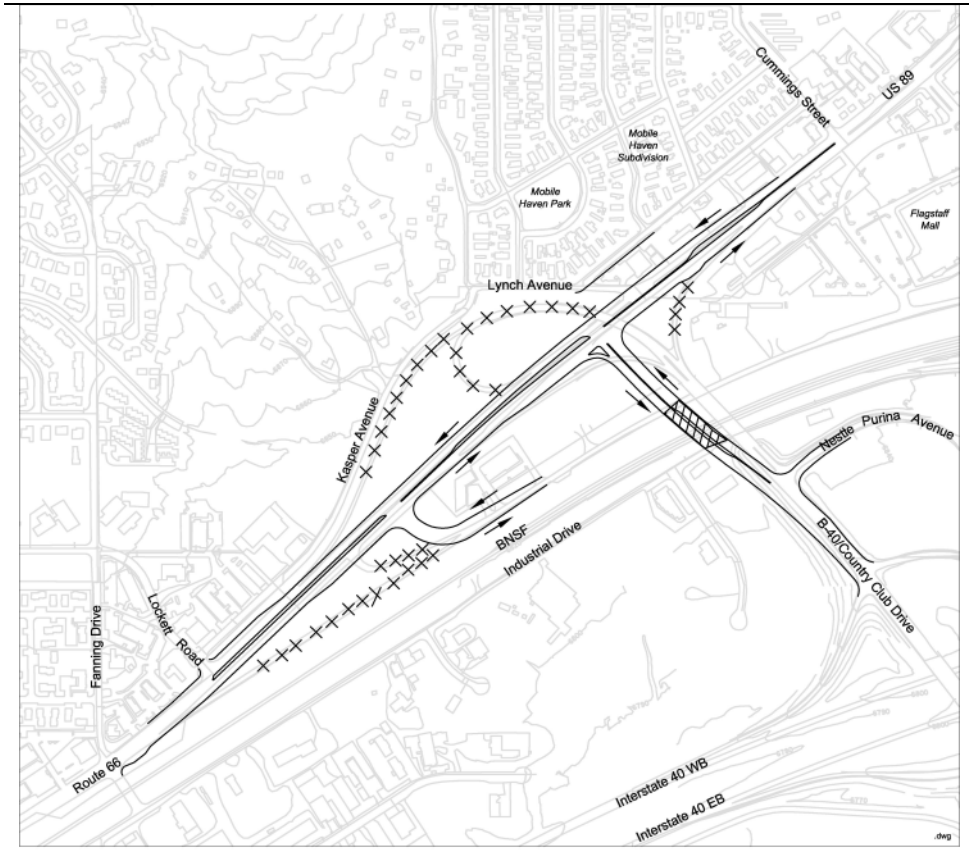
C. Preferred Alternative

The Preferred Alternative is Alternative 5A, which would connect B-40 directly to US 89 at a "T" intersection (Table 11; Figure 5). Alternative 5A was identified as the Preferred Alternative because the traditional intersection layout would be more compatible with the existing and planned roadways, impact fewer property owners and businesses, have less potential noise impacts to the Mobile Haven Subdivision, provide a direct pedestrian system through the project area, and alleviate back-ups and reduce traffic delays.

The addition of new sidewalks would provide a direct sidewalk/path system compatible with the City's FUTS and reduce potential vehicular conflicts for pedestrians who try to cross the road. The Preferred Alternative would construct stormwater detention basins to reduce local flooding problems and include an open channel conveyance/detention system for off-site flows. All the existing ramps of the US 89/B-40 interchange and the existing B-40 overpass structure would be removed.

The Preferred Alternative would be constructed in phases so that traffic flows can be maintained on US 89 and B-40. Temporary roads would be constructed next to B-40 and US 89 to carry traffic while improvements are being made. Once the improvements are completed, the temporary roads would be demolished and any area not paved would be revegetated. The location of the temporary road on the north side of US 89 would be used for part of the drainage improvements.

Table 11. Alternative 5A (Preferred)



Source: ADOT 2004

Key

Roadway improvements

Travel direction

Bridge

Remove roadway

Feet

0 600

NORTH

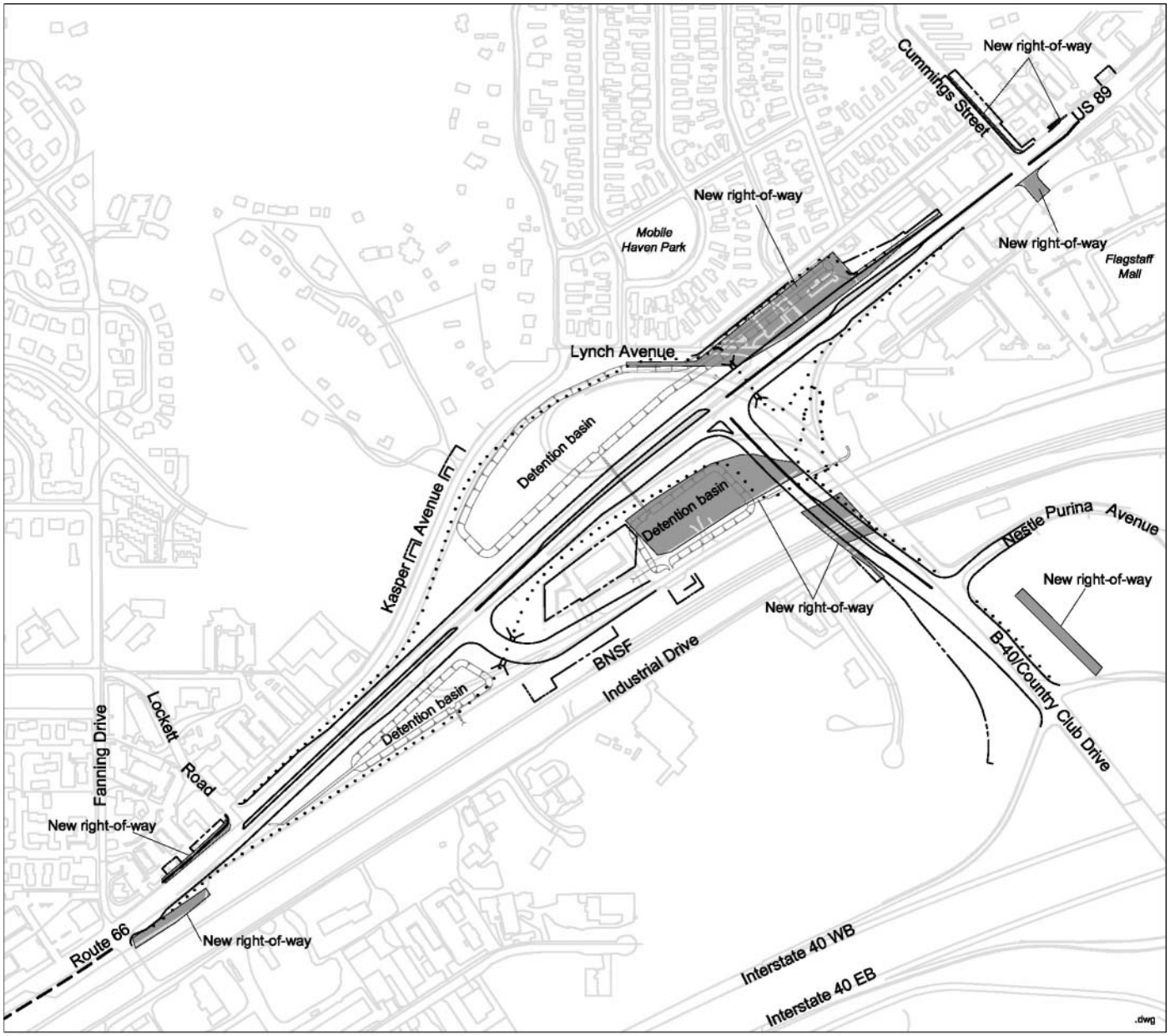
Description: Modification to Alternative 5, with "T" intersections constructed between US 89, B-40 and Route 66. B-40 would be widened to three lanes in each direction between US 89 and I-40, and a new bridge would be constructed over the BNSF tracks. US 89 would be raised approximately 16 feet from the existing roadway at the new intersection with B-40. US 89 would be widened to provide three lanes in each direction between Fanning Drive and Cummings Street.

Engineering/Operational Considerations

- Traditional intersection design is more consistent with driver expectation
- More compatible than other build alternatives with the existing and future roadways because of traditional intersection layout
- Eliminates the roadway curvature required in Alternatives 4, 4A, and 6
- Improves B-40 traffic capacity
- Lynch Avenue disconnected from US 89; some out-of-direction travel would be required to gain access to US 89 from the neighborhood north of the TI
- Allows for a higher volume of storage for stormwater than Alternatives 1, 2, 3, 4, 4A, 6, and 7

Environmental Considerations

- Potential take from 4 property owners
- Potential impacts to 9 businesses
- Potential impacts to 2 watercourses under the jurisdiction of COE
- Potential minimal increase in noise levels for Mobile Haven Subdivision
- Local motorists' continuity and general traffic pattern maintained on Lynch and Kasper Avenues and Lockett Road
- Notable change in visual character
- Pedestrian and bicycle movement is more direct than with Alternatives 1, 2, 3, 4, 4A, 6, and 7. Provides greater pedestrian/bicycle separation from roadway traffic



Source: ADOT 2004

Feet

0 600

Key

- Roadway improvements
- Temporary construction easement
- New sidewalk/ Flagstaff Urban Trails System trail
- Existing Flagstaff Urban Trails System
- Travel direction
- New right-of-way
- Pedestrian undercrossing

NORTH

Figure 5. Alternative 5A (Preferred)

Based on preliminary design, the Preferred Alternative would:

- Construct a new signalized US 89/B-40 intersection
- Widen B-40 to three lanes in each direction between US 89 and I-40
- Widen US 89 to three lanes in each direction and add turning lanes between Lockett Road and Cummings Street
- Replace the existing bridge structure over the BNSF tracks and construct retaining walls
- Construct a stormwater detention basin along the northwest side of the TI between US 89 and Kasper Avenue and two detention basins southwest of the TI between US 89 and Route 66
- Construct a sidewalk along the northwest side of US 89 between Lockett Road and Cummings Street and an extension of the FUTS along Route 66
- Construct a pedestrian underpass beneath US 89 to accommodate extension of the FUTS trail to the north and construct a pedestrian underpass under Route 66
- Construct a new signalized intersection with US 89 and Route 66
- Install traffic signal at Cummings Street and construct intersection improvements including a new main Flagstaff Mall entrance
- Remove existing traffic signal at existing Flagstaff Mall entrance
- Construct retaining wall near Flagstaff Eastgate Commercial Center
- Require 5 total takes from 5 private property owners and 13 partial takes from 11 private property owners
- Require 6 acres of new R/W and 2 acres of temporary construction easements (TCEs)

The Preferred Alternative would cost approximately $18 million.

IV. AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND MITIGATION MEASURES

The following information describes the affected (existing) environment in the project area and presents the potential effects of the Preferred and No Action Alternatives. Measures to avoid or minimize impacts have also been identified and are summarized in the mitigation measures in this section. Land ownership is identified in terms of public or private holdings. Jurisdiction implies the authority to regulate land use. The visual or scenic resources identified extend beyond the project limits.

A. Methodology for Assessing Impacts

Potential impacts are described in terms of intensity, duration, type (beneficial or negative), and context (site-specific, local, or regional). For the purposes of this analysis, intensity or severity of the impact is defined as:

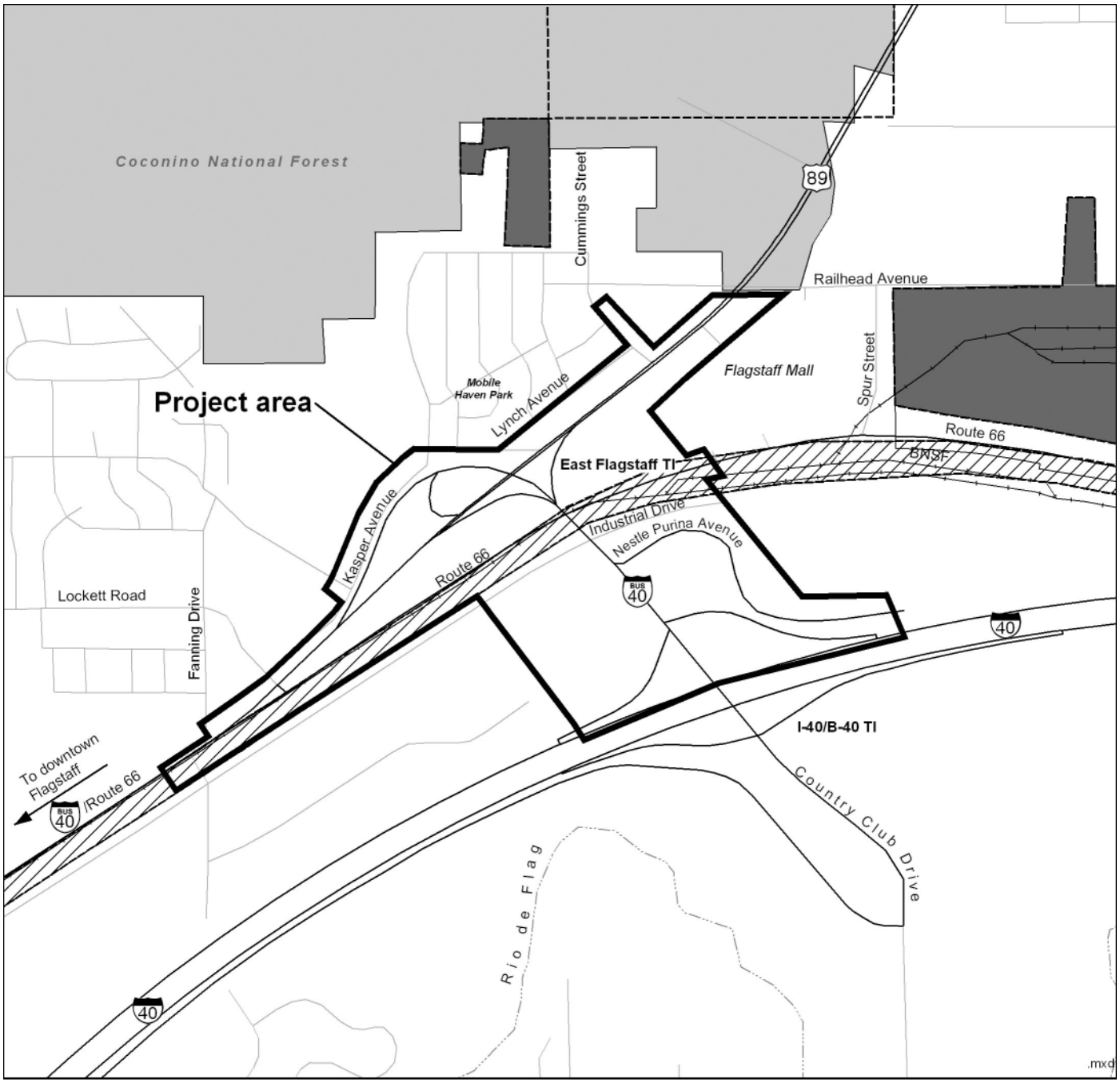
- *Negligible* – impact to the resource is barely perceptible or not measurable, and confined to a small area.
- *Minor* – impact to the resource or discipline is perceptible or measurable, and is localized.
- *Moderate* – impact is clearly detectable or measurable and could have appreciable effect on the resource or discipline.
- *Major* – impact would have a substantial, highly noticeable influence on the resource.

For the purposes of this analysis, duration of the impact is defined as:

- *Short-term* – impacts that would be less than 5 years in duration.
- *Long-term* – impacts that would be 5 years or more in duration.

B. Land Ownership, Jurisdiction, and Land Use

There are both public and private lands in the project area. Private lands compose the majority of the land ownership (Figure 6). The rail lines are owned and operated by BNSF and defined as private land. The project area lies within the Flagstaff city limits. Land uses are a representation of existing occupation and/or a physical use of land. Existing major land uses in the project area consist of residential, commercial, industrial, transportation (railroad/highways), and undeveloped (Figure 7). Transportation land uses compose the greatest portions of the project area. Commercial land uses include retail business



Source: Arizona Transportation Information System Coverage (2002)

Key

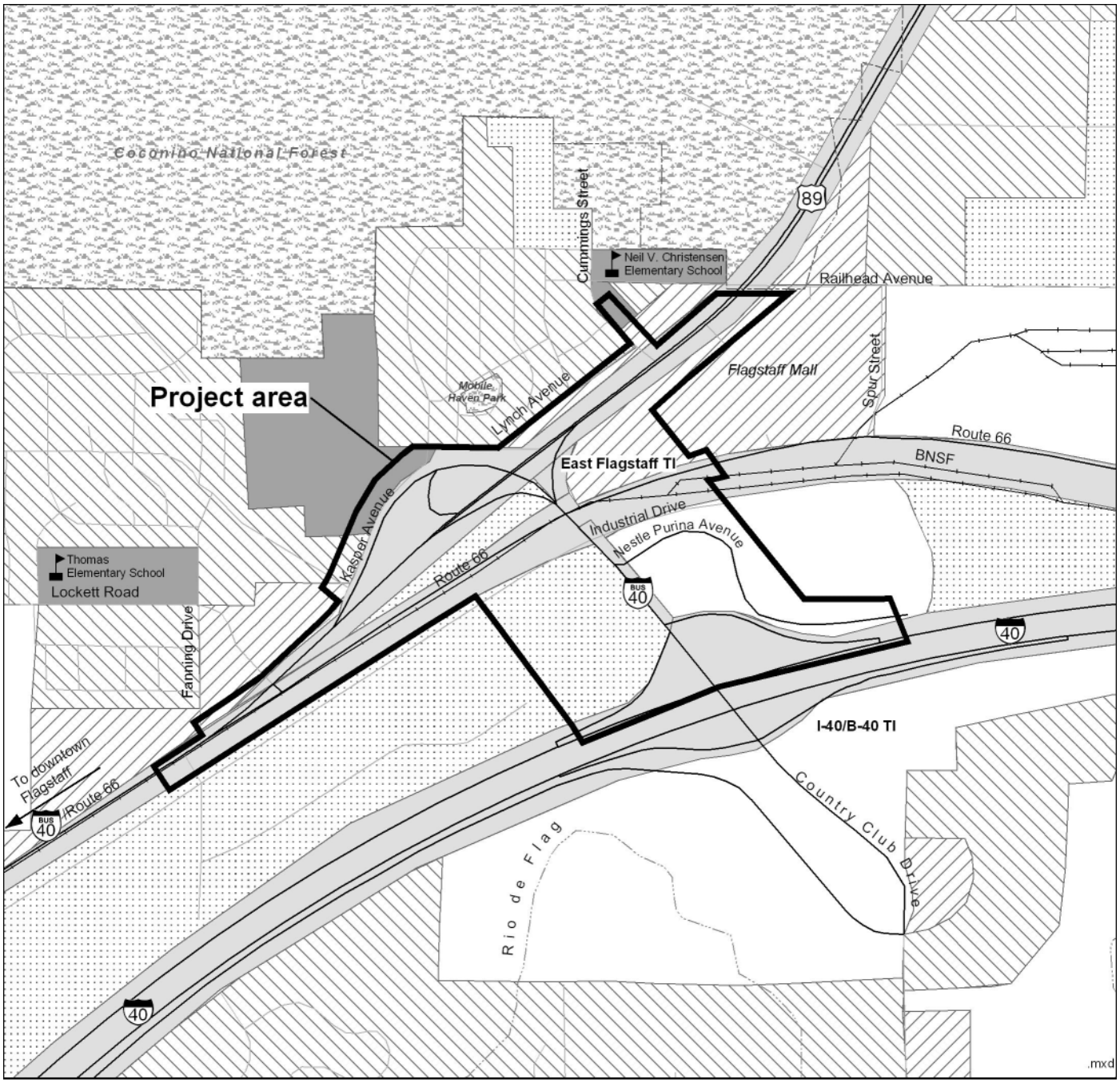
- Project area
- City of Flagstaff
- Coconino National Forest
- County
- BNSF
- City of Flagstaff limits

Mile

0 0.25 0.5

NORTH

Figure 6. Land jurisdiction/ownership



Source: Arizona Transportation Information System Coverage (2002)

Key

- Project area
- Coconino National Forest boundary
- Commercial
- Industrial
- Institutional
- Open space
- Residential
- Transportation
- Vacant

Mile

0 0.25 0.5

NORTH

Figure 7. Land use

complexes, restaurants, manufacturing, and distribution warehousing. The recreation land use includes portions of the FUTS. A community park (Mobile Haven Park) is located adjacent to the project area in addition to residential land uses. There are single-family residences and townhouses adjacent to the project area to the north and a residential community south of I-40. Neil V. Christensen and Thomas Elementary Schools and a church (West Branch Ministry of the Bill Rice Ranch) are located adjacent to the project area.

The short- and long-term effects on land use with the Preferred Alterative would be the conversion of 6 acres of existing commercial and industrial uses and incorporation of the land into a permanent transportation facility. No residential structures would be acquired. Private property owners would be compensated at market value for property that would be acquired, in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act, as amended in 1987. The amount of land required for the proposed improvements would be relatively small compared to the amount of private land adjacent to the corridor. The major land uses adjacent to the project area—residential, commercial, and industrial—would not be substantially altered by the implementation of this project.

The Preferred Alternative would maintain existing uses, but lands would be converted as part of a transportation corridor. Therefore, the Preferred Alternative would have short- and long-term minor negative project area impacts in terms of land ownership, jurisdiction, and land use.

There would be no impact to land ownership, jurisdiction, or land use with the No Action Alternative.

C. Social and Economic Resources

The following discussion identifies and evaluates impacts that may occur to the social and economic environment in the project area. Specific topics addressed in this section include 1) economic impacts; 2) neighborhood continuity; 3) social services, schools, and recreation; 4) emergency services; 5) relocations/displacements; and 6) access and traffic patterns.

1. Economic Impacts

Primary economic sectors in Coconino County include commercial businesses, tourism, and government service. Coconino County and the urbanized areas of the city of Flagstaff have experienced substantial population growth in the last several decades. Business development and increased tourism (composed mainly of cross-country travelers and winter visitors) continue to contribute to economic growth in the area.

The Flagstaff Mall is located immediately east of the East Flagstaff TI (Figure 8). According to Westcor, the Mall's owner, and verified by the City of Flagstaff, since its opening in 1979, Flagstaff Mall has generated more sales tax revenue than any other single entity in Flagstaff and provided an estimated 1,500 jobs for residents. Anticipated short-term negative economic impacts associated with construction include reduced business revenue at the Mall because of potential customer avoidance during construction. Additionally, a temporary traffic detour route would limit access to Elrod Manufacturing and the adjacent Flagstaff Eastgate Commercial Center (containing seven commercial businesses) and may result in customer avoidance of this area as well. Customer avoidance may be caused by travelers' anticipation of delays as well as of required out-of-direction travel; refer to *Section C. 6. Access and Traffic Patterns* for more information about potential access and traffic impacts.

Short-term economic impacts would also occur with the relocation of five businesses south of Lynch Avenue. However, as stated in *Section B. Land Ownership, Jurisdiction, and Land Use,* these property owners would be compensated at market value, to allow for relocation. Partial R/W takes and TCEs would impact approximately 21 parcels (19 private property owners and the City of Flagstaff), representing 23 existing commercial and industrial businesses; however, access to these businesses would be maintained during project activities.

The Preferred Alternative is anticipated to result in long-term beneficial economic impacts. It would result in enhanced pedestrian/bicycle and vehicular access to the Flagstaff Mall area. The improved traffic operations and improved access (including a new main entrance to the Mall) would allow for planned expansion of businesses in and near the Flagstaff Mall; the City of Flagstaff estimates that the Flagstaff Mall expansion would aid in the creation of more than 300 new, permanent jobs (City of Flagstaff 2004a).

The Preferred Alternative would have short-term adverse but long-term beneficial economic impacts. Although customer avoidance during construction may occur, and five businesses would be offered relocation, implementation of the Preferred Alternative would result in enhanced access to existing businesses and allow for planned commercial growth.

The No Action Alternative would not result in any partial or full acquisitions. However, under this alternative, access to existing and planned development would not be accommodated. Therefore, the No Action Alternative would have no short-term economic impacts, but would result in long-term negative economic impacts by constraining future commercial growth in the area.

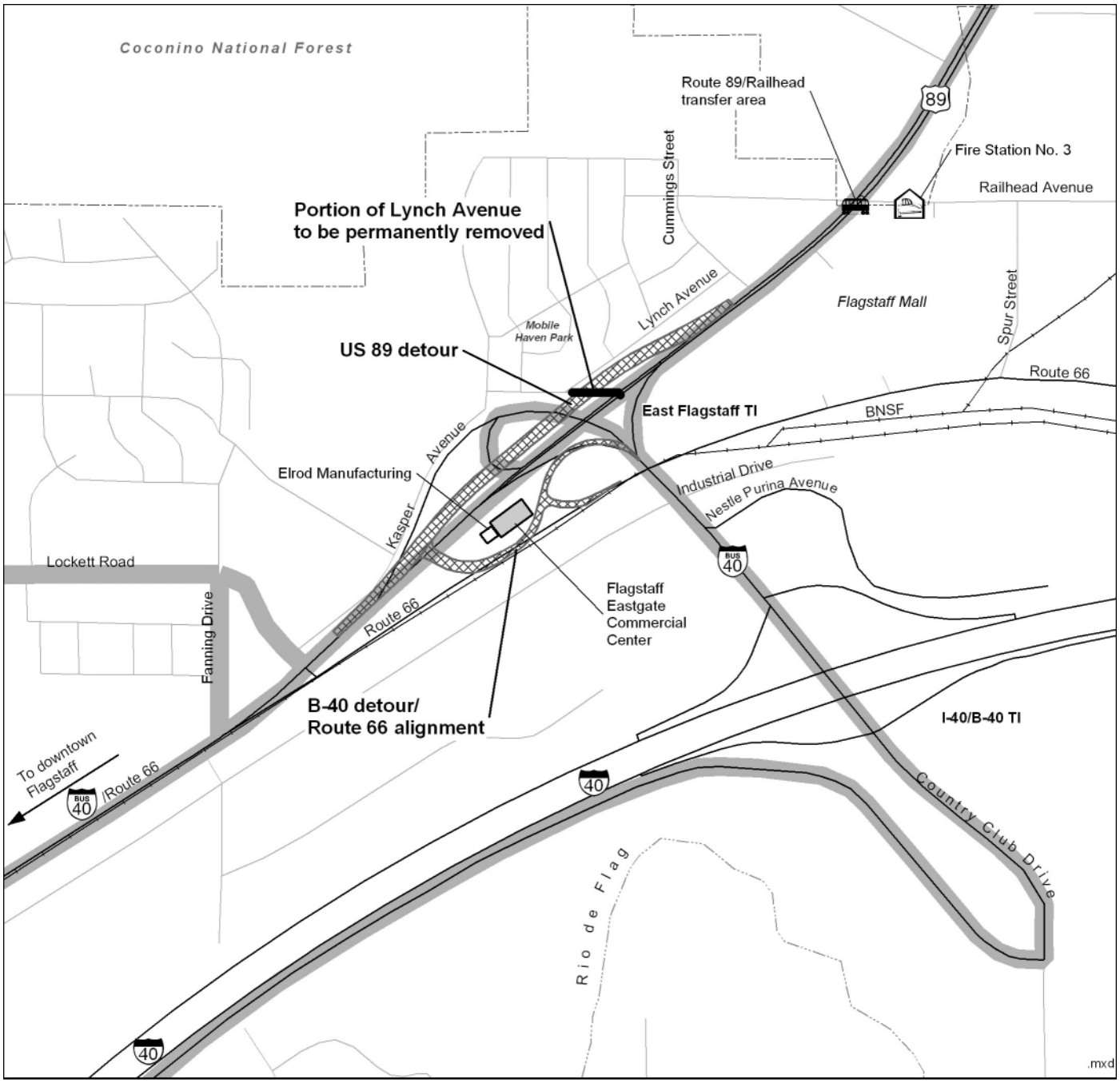


Figure 8. Temporary detour routes

2. Neighborhood Continuity

Neighborhood continuity can be defined as the local area's interconnectivity or community cohesion among services, including hospitals, government offices, schools, post offices, businesses, and residences. The existing conditions of the East Flagstaff TI result in traffic congestion and back-ups. The residential neighborhoods south of I-40 along B-40 (Country Club Drive) and northwest of the East Flagstaff TI are generators of pedestrian traffic going to and from the Flagstaff Mall, which is separated from these neighborhoods by roadways and the BNSF tracks. However, the sidewalk system along US 89 and along B-40 (Country Club Drive) from I-40 to US 89 is noncontinuous, and no sidewalks are present on the structure over the BNSF tracks. Currently, pedestrians walk through box culverts under I-40 west of the TI and cross the BNSF tracks at various unauthorized at-grade locations. The current vehicular operation issues and existing lack of pedestrian/bicycle facilities are barriers to the connectivity of this community.

The Preferred Alternative would result in improved vehicular and pedestrian/bicycle traffic operations, more efficiently moving travelers to and between community services and destinations (e.g., the Flagstaff Mall) and avoiding existing barriers (e.g., providing pedestrian access over the BNSF tracks). The construction of a trail along US 89, B-40, and Route 66 would provide a connection to the existing FUTS and would provide enhanced access for pedestrians/bicyclists to the Flagstaff Mall and other area services. Therefore, the Preferred Alternative would result in long-term beneficial impacts to neighborhood continuity/community cohesion.

Under the No Action Alternative, the existing conditions would continue, resulting in no improvement of pedestrian/bicycle connectivity or facilities and continued delays and degradation of traffic operations. Therefore, although no short-term impacts would occur, the No Action Alternative would create minor long-term negative impacts to neighborhood continuity/community cohesion.

3. Social Services, Schools, and Recreation

Medical services (the Flagstaff Medical Center Physical Therapy and Walk-in Medical Care), two schools, a community park, a designated bike route, and segments of the FUTS are located within and adjacent to the project area.

The Preferred Alternative would require the acquisition of the Flagstaff Medical Center property, which would affect two businesses: the Flagstaff Medical Center Physical Therapy and the Flagstaff Walk-in Medical Care. Patients would need to seek medical attention elsewhere; however, there are other physical

therapy and same-day walk-in medical facilities in Flagstaff. The nearest medical center to the project area is Concentra Managed Care, approximately 4.8 miles away, or the Flagstaff Medical Center, approximately 5 miles away, which is a not-for-profit hospital with an active staff of over 178 physicians (Northern Arizona Healthcare 2004). Because of the acquisition of these facilities, construction of the Preferred Alternative would result in short-term negative impacts to social services; because of potential facility relocation and the proximity of Concentra Managed Care and the Flagstaff Medical Center, this impact would be negligible.

The two schools (Thomas Elementary and Neil V. Christensen Elementary Schools) are located north of the project limits, along Lockett Road and Railhead Avenue (Figure 8). The community park, Mobile Haven Park, is also located north of the project limits. This 1.8-acre city park includes a playground, volleyball and basketball courts, and restrooms. Although traffic delays could occur during construction of the Preferred Alternative, access to both the schools and the park would be maintained. The contractor would coordinate with the Superintendent of the Flagstaff Unified School District (928-527-6000) 14 calendar days prior to traffic-disrupting activities to allow for coordination of school bus routes during construction.

Currently, there are no sidewalks along B-40 between Nestle Purina Avenue and US 89 within the project area. Sidewalks are present only on the north side of US 89 and B-40 from Cummings Street to Fanning Drive. A segment of the FUTS is present in the western portion of the project area, along B-40 east to just past Fanning Drive; a designated bike route is present on Fanning Drive north of US 89. Implementation of the Preferred Alternative would mean construction of new sidewalks and trails within the project limits, providing long-term benefits to pedestrians and other users of the trails.

Although traffic patterns during construction of the Preferred Alternative would result in short-term traffic delays and out-of-direction travel, access to the schools and the park would be maintained during construction. If the Preferred Alternative is implemented, the reconstructed TI would provide a long-term beneficial impact to social services, schools, and recreation in the form of enhanced access, improved traffic efficiency, and enhanced trail connectivity.

Without the improvements (the No Action Alternative), traffic delays would continue to increase in frequency and duration and no new segments of the FUTS would be constructed—a long-term negative impact to all social services, schools, and recreation facilities in the project area.

4. Emergency Services

Flagstaff Fire Station No. 3 is located along Railhead Avenue, just east of the project limits (Figure 8). Under the Preferred Alternative, temporary detours and out-of-direction travel would be required. However, access to the fire station would be maintained throughout construction. The contractor would coordinate with the office of the City of Flagstaff Fire Chief (928-868-7609) 14 calendar days prior to construction activities to inform it of detour routes and closure dates and durations. Two other fire stations, Flagstaff Fire Station Nos. 2 and 4, are located within 1.5 miles of the project area. Both stations are located west of the project area; Flagstaff Fire Station No. 2 is located north of US 89/Route 66/B-40/I-40 and Fire Station No. 4 is located south of these transportation features.

Although short-term negative impacts to emergency services would occur because of temporary traffic delays during construction, Flagstaff Fire Station Nos. 2 and 4 are located nearby. The Preferred Alternative would have a long-term beneficial impact to emergency services by providing more efficient traffic operations.

Under the No Action Alternative, no traffic operation improvements would be made; therefore, as traffic flows continue to deteriorate without roadway improvements, this alternative would have a long-term negative impact on emergency services.

5. Relocations/Displacements

Construction of the Preferred Alternative would require the total acquisition of five privately owned parcels of land. These parcels include five businesses (two of which are situated on one parcel) and a vacant lot. The businesses that would require relocation under this alternative are the Flagstaff Medical Center Physical Therapy, the Walk-in Clinic, Jake's Bar and Grill, the Flagstaff Car Wash, and National Auto Sales. Improvements associated with the proposed project would also require TCEs or partial takes of land on approximately 21 parcels of land (representing 19 private property owners and the City of Flagstaff); these acquisitions would not require relocation or displacement of any businesses. Partial takes and TCEs required for the Preferred Alternative would not require closures of businesses. Because property owners would be compensated at fair market value for property acquired for project R/W in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act*, as amended in 1987, they could be reestablished, and, therefore, these impacts would be considered short-term negative impacts.

Under the No Action Alternative, no total or partial takes or new TCEs would be required; therefore, there would be no short- or long-term relocational or displacements impacts.

6. Access and Traffic Patterns

The project area is a multimodal transportation locale. Vehicular travel along city streets, US 89, B-40, Route 66, and I-40; transit service; and pedestrian and bicycle routes are all present in the area. Under the Preferred Alternative, access and traffic patterns would be temporarily and permanently impacted.

Under the Preferred Alternative, Lynch Avenue would be permanently disconnected from US 89; travelers from the neighborhood north of the project area would need to gain access to US 89 from either Cummings Street (approximately 1,300 feet to the east) or Kasper Drive to Lockett Road (approximately 2,700 feet to the west) (Figure 8). Currently, Route 66 intersects US 89 by way of two one-way streets in the western portion of the project area. Route 66 would be permanently reconfigured to provide access to US 89 by way of a two-way road just west of the Flagstaff Eastgate Commercial Center and the adjacent Elrod Manufacturing building; a temporary traffic signal would be installed at the new Route 66/US 89 intersection (Figure 8). To construct this new alignment, Route 66 would be temporarily closed to traffic west of the commercial center. This would require a temporary, circuitous route around Flagstaff Mall—consisting of up to 1.7 miles of out-of-direction travel—to enter into or depart from the commercial center by way of US 89 or B-40.

Temporary detours for US 89 and B-40 would also be required. A two-way US 89 detour road would be constructed north of the current alignment, allowing continuing use of US 89 and its intersections with Cummings Street and Fanning Drive throughout the majority of the construction period (Figure 8). A temporary two-way B-40 detour road would be constructed west of the B-40 alignment, forming an “S” curve around the Flagstaff Eastgate Commercial Center and the Elrod Manufacturing building (Figure 8). This detour would allow traffic to connect among B-40, Route 66, and US 89. This detour would require all motorists wishing to gain access to Route 66 in the project area, and all B-40 northbound traffic, to pass in front of the Flagstaff Eastgate Commercial Center/Elrod Manufacturing buildings and would require closure of one of the two access points into Flagstaff Eastgate Commercial Center, and may require relocating the existing access into Elrod Manufacturing. This detour would also be used during a potential closure of the EB B-40 to NB US 89 ramp, and require out-of-direction travel of approximately 0.8 mile. To facilitate access to/egress from the Flagstaff Eastgate Commercial Center/Elrod Manufacturing buildings, directional signs would be erected and traffic would be maintained at 25 miles per hour. The temporary US 89 and

B-40 detour roads would be demolished after construction of the new TI roadway configuration; these areas would be incorporated into detention basins or returned to preconstruction conditions.

During removal of the B-40 bridge over US 89, the US 89 roadway would be temporarily closed to traffic. This closure would occur during nighttime hours and would be anticipated to be completed during one weekend. However, during the temporary closure of US 89, the contractor would allow emergency vehicles access through this construction area. During this short-term full closure of US 89, traffic could continue through the area by way of Kasper Avenue to Lockett Road to Lynch Avenue to Cummings Street (north of the project area) or the new Route 66 roadway to Spur Street to Railhead Avenue (south of the project area).

Throughout construction, temporary work along in-use portions of B-40, US 89, and Route 66, as well as Nestle Purina Avenue, may require temporary lane closures and/or flaggers. Traffic control would be in accordance with the most current *Manual on Uniform Traffic Control Devices for Streets and Highways*, published by the US Department of Transportation, FHWA, including any revisions or additions, and/or associated provisions in the project plans, as determined by the ADOT Traffic Design Section during design.

Three transit routes (Mountain Line's "66 Red," "2 Blue," and "3 Green"), four bus stops, and a transfer area (Route 89/Railhead Transfer Area) are within 0.25 mile of the project area. The three transit routes are located within the project area; existing bus stops are located along Fanning Drive, Railhead Avenue, and at the Flagstaff Mall (which also houses the transfer area)—all outside the project limits. All three routes converge at the transfer area, which allows travelers to transfer between any of the three bus routes. Mountain Line's "66 Red" follows East Route 66 from the transfer area west through downtown and south to the I-17/I-40 interchange. Transit route "2 Blue" extends from the transfer area along Route 66/ B-40 through the project area, stopping twice along Fanning Drive, before continuing through residential areas west of the project area, and extending to downtown Flagstaff. Also extending from the transfer area is "3 Green," which crosses the project area at Country Club Drive before heading west to downtown Flagstaff; this route has two stops at the Flagstaff Mall.

As with other traffic within the project limits, temporary detours and out-of-direction travel may be required for transit routes. The contractor would coordinate with Mountain Lines (928-779-6624) prior to any traffic-disturbing activities to allow for planning for bus route detours and delays during construction. Under the Preferred Alternative, two new bus bays would be constructed along the south side of US 89, one just east

of Fanning Drive and one 0.8 mile west of Cummings Drive. Because of the installation of new bus stops and because of the increased traffic operations within the improved TI, the Preferred Alternative would result in long-term beneficial impacts to transit service.

Under the No Action Alternative, no short-term impacts to transit service would occur; however, the projected degradation of level of service at the TI without improvements would result in major long-term negative impacts to transit service.

Because of the lack of continuous sidewalks or trails within the project area, pedestrians/bicyclists currently use nondesignated paths to traverse the project area. During construction, short-term impacts to these travelers as a result of the Preferred Alternative would be limited to exclusions from work zones and potential out-of-direction travel. The designated bike route along Fanning Drive would not be impacted during construction of the proposed improvements. However, the proposed addition of trail segments and sidewalks within the project limits would result in long-term beneficial impacts for users as new connections and facilities are made available to the traveling public.

Under the No Action Alternative, the existing lack of continuous pedestrian and bicycle facilities would remain, resulting in a long-term negative impact to these users. The No Action Alternative would have no short-term impacts to these users.

The Preferred Alternative would have a substantial short-term negative impact to existing access and traffic patterns, as would be expected with construction at a major TI. However, the improved TI would provide enhanced traffic operations and access to area businesses, resulting in long-term beneficial impacts.

Under the No Action Alternative, no short-term impacts to access or traffic patterns would occur. However, because the existing issues at the TI would not be addressed, this alternative would result in major long-term negative impacts to traffic patterns and access.

7. Other Social and Economic Considerations

Flagstaff's topographic and atmospheric conditions create a unique setting for astronomical observation. To maintain this community value, ADOT would ensure that lighting associated with the Preferred Alternative is designed in accordance with the Flagstaff Lighting Code (*Division 10-08-002. Development Lighting Regulations*) (City of Flagstaff 2004b).

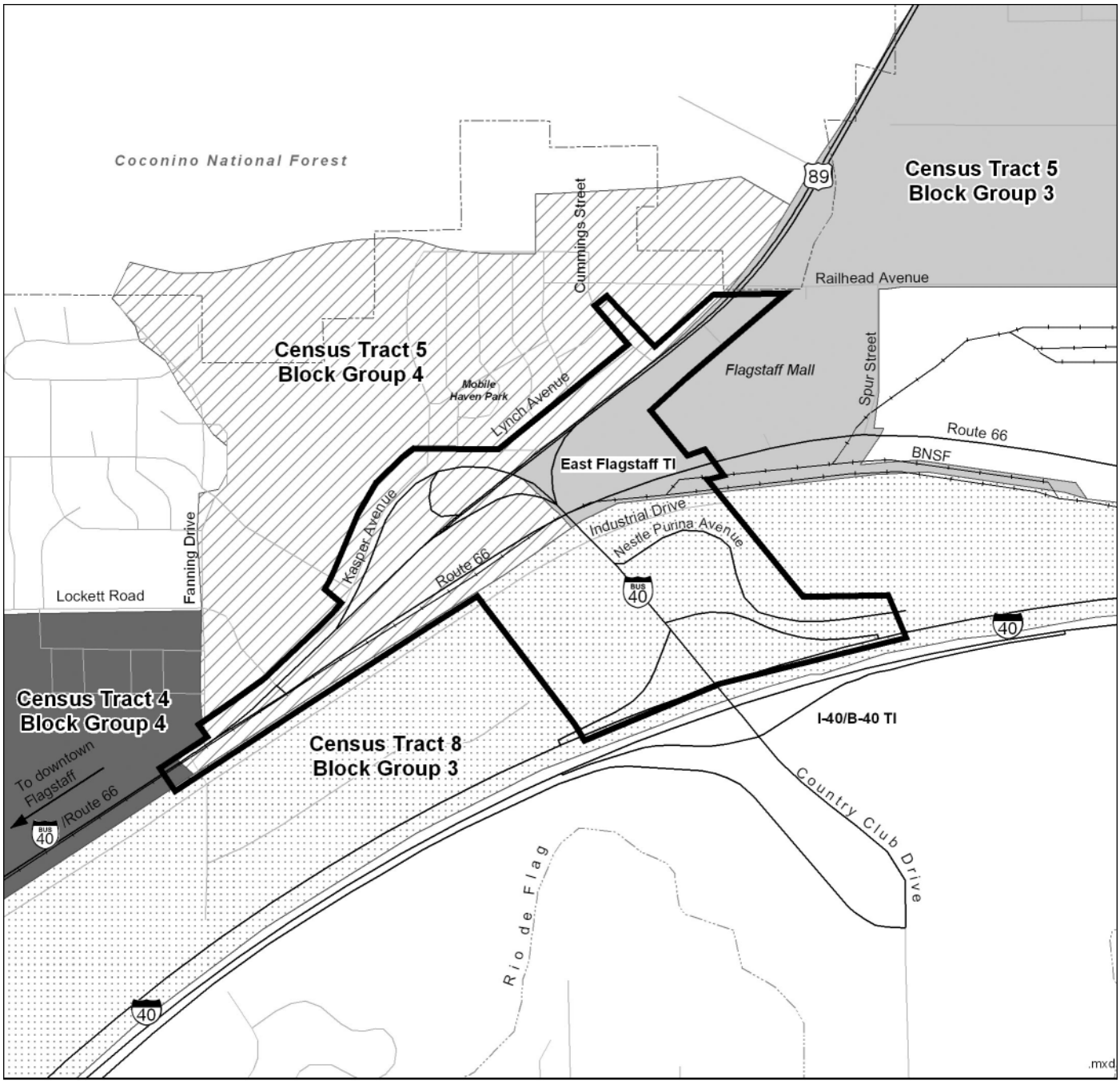
D. Title VI/Environmental Justice

Title VI of the Civil Rights Act of 1964 and Executive Order 12898 provide guidance on identifying sensitive populations to prevent the exclusion of persons or populations from participation in, denial to persons or populations the benefits of, or the subjection of persons or populations to discrimination under any program or activity receiving federal financial assistance because of race, color, or national origin. See Appendix A for more information on the definition of Title VI and Environmental Justice parameters.

The demographic composition of the project area was calculated using the *Census 2000, Summary File 3* (US Department of Commerce 2000). Census tracts are relatively permanent geographic subdivisions used for recording census information; tracts do not cross county boundaries. Block groups are further geographic subdivisions of census tracts comprising a compact and contiguous cluster of census blocks, the smallest subdivision used by the Census Bureau. The boundaries of all census tracts and block groups in the project area extend beyond the project boundaries; therefore, the exact population and demographic characteristics of the project area may vary from the represented block group data in Tables 12 and 13. Notable differences in the statistics reported for each category are shaded in these tables.

The project area lies entirely within three census tracts and a total of four block groups (Figure 9). The population of the block groups ranges from 128 to 1,243 persons (Table 12). According to the 2000 Census, the racial and ethnic makeup of the city of Flagstaff and Coconino County in 2000 was predominantly White, Hispanic, and Native American (Table 12). Of the four block groups that encompass the project area, Tract 4 (Block Group 4) had population percentages greater than the city of Flagstaff's and Coconino County's for four racial categories: for Flagstaff, African American and Asian; for Coconino County, Native American and Other Races.

All four block groups report a higher percentage of minority population in comparison to both the city of Flagstaff and of Coconino County, with Tract 4 (Block Group 4) reporting the highest percentage (57 percent). Tract 8 (Block Group 3) indicates a higher percentage (23 percent) of the population to be 60 years of age or older when compared to the corresponding percentages in the populations of the city of Flagstaff and of Coconino County. Tract 4 (Block Group 4) and Tract 5 (Block Group 4) also indicate higher percentages of the population to be 60 years of age or older (9 percent) when compared to the city of Flagstaff. Three of the four block groups record a higher percentage of disabled population when compared to the city and county. The percentages of low-income persons are roughly equal to or are less than the percentages of those of the city and county (Table 13). Two of the four block groups record a higher



Source: Census 2000

Key

- Project area
- Census Tract 4, Block Group 4
- Census Tract 5, Block Group 3
- Census Tract 5, Block Group 4
- Census Tract 8, Block Group 3

Mile

0 0.25 0.5

NORTH

Figure 9. Census tract and block group locations

Table 12. 2000 Racial and ethnic demographics

Area	Total population	White		African American		Native American		Asian		Pacific Islander		Other race		Two or more races		Hispanic[a]	
		#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Tract 4, BG 4	969	542	56	85	9	260	27	26	3	0	0	56	6	0	0	194	20
Tract 5, BG 3	576	357	62	0	0	166	29	0	0	0	0	37	6	16	3	79	14
Tract 5, BG 4	1,243	803	65	0	0	217	17	0	0	0	0	141	11	82	7	425	34
Tract 8, BG 3	128	71	55	0	0	0	0	0	0	0	0	57	45	0	0	57	45
Total Tracts	6,833	4,907	73	153	2	954	14	75	1	0	0	399	6	255	4	1,090	16
City of Flagstaff	53,137	41,750	79	1,047	2	4,936	9	723	1	42	0	3,162	6	1,477	3	8,572	16
Coconino County	116,320	73,702	63	1,368	1	32,826	28	894	1	194	0	4,645	4	2,691	2	88,896	56

Source: US Department of Commerce, Bureau of the Census. C*ensus 2000 Summary File 3*.
Note: # = Number, % = Percentage, BG – Block Group.
Shaded areas denote percentages higher than comparison areas' (city and county) percentages.

[a] "Hispanic" refers to ethnicity and is derived from the total population, not as a separate race; i.e., it is calculated differently from the other columns in this table.

Table 13. 2000 Total Minority, Age 60 Years and Over, Below Poverty Level, Disabled, and Female Head of Household Populations

Area	Total population	Total minority[a]		Elderly		Total population for whom disabled is determined	Disabled		Total population for whom poverty is determined	Low-income		House-holds	Female head of household	
		#	%	#	%		#	%		#	%		#	%
Tract 4, BG 4	969	551	57	92	9	636	186	29	588	101	17	289	104	36
Tract 5, BG 3	576	261	45	42	7	401	56	14	375	27	7	173	45	26
Tract 5. BG 4	1,243	583	47	106	9	846	250	30	790	60	8	354	127	36
Tract 8, BG3	128	57	45	29	23	105	25	24	93	11	12	52	8	15
Total Tracts	6,833	2,325	34	524	8	5,084	943	19	4,876	551	11	2,501	769	31
City of Flagstaff	53,137	16,011	30	4,173	8	41,844	6,920	17	40,243	6,448	16	19,355	5,675	29
Coconino County	116,320	49,232	42	11,824	10	107,350	17,511	16	113,076	20,609	18	40,386	11,084	27

Source: US Department of Commerce, Bureau of the Census. C*ensus 2000, Summary File 3*.
Notes: See table notes for Table 12, above.

[a] "Total Minority" is composed of all people who consider themselves Non-White racially plus those who consider themselves White Hispanic

percentage of female head of household populations than the percentages for the city and county: Tract 4 (Block Group 4) reports 36 percent, as does Tract 5 (Block Group 4) (Table 13).

Residential neighborhoods are located south of I-40 along B-40 (Country Club Drive) and northwest of the East Flagstaff TI and are generators of pedestrian traffic going to and from the Flagstaff Mall and adjacent commercial businesses. These neighborhoods are separated by roadways and the BNSF tracks. The existing sidewalk system along US 89 and along B-40 (Country Club Drive) from I-40 to US 89 is noncontinuous, and no sidewalks are present on the structure over the BNSF tracks. Therefore, no designated pedestrian system exists. Pedestrians walk through box culverts under I-40 west of the TI and cross the BNSF tracks at various unauthorized at-grade locations. With the implementation of the Preferred Alternative, a continuous pedestrian link would be provided, including pedestrian access over the BNSF tracks. This would improve pedestrian/bicycle traffic operations and efficiently move travelers to and between community services and destinations. The trail proposed for construction along US 89, B-40, and Route 66 would connect to the existing FUTS and would provide enhanced access for pedestrians/bicyclists to the Flagstaff Mall and other area services. Construction of the Preferred Alternative would construct new Americans with Disabilities Act (ADA)-compliant sidewalks and trails within the project limits, providing long-term benefits to pedestrians and users of the trail. Therefore, the Preferred Alternative would result in long-term beneficial impacts to adjacent neighborhoods.

During construction and with the implementation of detour routes, local business employees and patrons may be required to encounter some out-of-direction travel and, therefore, extended travel times. These temporary impacts would be of short duration and would affect all populations equally. No segment of the protected populations would be disproportionately affected by the proposed project because construction-related impacts would similarly affect all residents, business people, and visitors. There would be no displacement of any residents, no permanent disruption of community cohesion or neighborhood continuity, and no permanent impact to access to any community facilities. Access to the schools and the park would be maintained during construction.

The Preferred Alternative would require the acquisition of the Flagstaff Medical Center property, which would affect two businesses, Flagstaff Medical Center Physical Therapy and the Flagstaff Walk-in Medical Care. All patients would need to seek medical attention at a nearby medical facility. Other physical therapy and same-day walk-in medical facilities are located in Flagstaff. The Flagstaff Medical Center, a not-for-profit medical center nearest to the project area, is approximately 4 miles away. The acquisition of the Flagstaff Medical Center property and its two facilities would result in short-term

negative impacts to social services. Because the two facilities would be relocated and because of the proximity of the Flagstaff Medical Center, these impacts would be considered minor.

Under the No Action Alternative, the existing conditions would continue, resulting in no improvement of pedestrian/bicycle connectivity or of facilities and continuing degradation of traffic operations and continued delays. Therefore, although no short-term impacts would occur, the No Action Alternative would have minor long-term negative impacts to neighborhood continuity/community cohesion.

The Preferred Alternative would not disproportionately impact racial minority, elderly, and/or low-income populations in the city of Flagstaff and Coconino County because the Preferred Alternative would not displace any residences, permanently disrupt community cohesion or neighborhood continuity, permanently impact access to any community facilities, or isolate, exclude, or separate minority or low-income individuals from the broader community. Census data largely summarize the demographics of people *living* in an area and do not tally the characteristics of local businesses, including employees, customers, and owners/managers. The census data do not address the presence of businesses and the employment opportunities and services created through the existing local commercial infrastructure. There is no indication that any minority-owned businesses would be disproportionately impacted. Overall, no segment of the minority or low-income population would be disproportionately affected by the proposed project because construction-related impacts would similarly affect all residents, business people, and visitors.

Opportunities for input into the decision-making process were provided to the community at-large at the public information meetings and hearings. Details of the agency and public involvement activities for the project are described in Section V. Benefits of this project for all motorists and pedestrians using the improved facility include decreased delays, increased efficiency of traffic flows, and improved pedestrian mobility. The Preferred Alternative has been developed in accordance with Title VI of the Civil Rights Act of 1964, as amended by the Civil Rights Act of 1968 (Title VIII), and conforms to the requirements of the ADA of 1990.

Based on this analysis, the Preferred Alternative and the No Action Alternative would cause no short- or long-term disproportionate negative impacts on Title VI and/or Environmental Justice-protected populations.

E. Cultural Resources

Historic properties include prehistoric and historic districts, sites, buildings, structures, or objects included in or eligible for inclusion in the National Register of Historic Places (NRHP). Historic properties may be eligible for nomination to the NRHP if they "… possess integrity of location, design, setting, materials, workmanship, feeling and association …" and if these resources are either associated with (a) significant themes in our nation's history, (b) significant persons in our nation's history, or if they (c) embody distinctive construction characteristics or works of a master, or (d) have the potential to contribute information significant to history or prehistory.

1. Survey Data

The project area has been completely surveyed for cultural resources and the results reported in *A Cultural Resources Survey of 92.4 Acres at the Intersection of US 89 and I-40, Flagstaff, Coconino County, Arizona* (ADOT 2004b), *Cultural Resource Survey on Interstate 40, Rio de Flag Crossing to Country Club Drive, Flagstaff, Coconino County, Arizona* (ADOT 2002b), and *A Cultural Resource Survey of United States Route 89 from Fanning Drive to Townsend Road, Coconino National Forest, Peaks Ranger District, Flagstaff, Coconino County, Arizona* (ADOT 2001).

Archaeological site and inventory reports were reviewed at the Arizona State Museum in Tucson, ADOT in Phoenix, and at the State Historic Preservation Office (SHPO) in Phoenix. Historic General Land Office maps at the Bureau of Land Management office were consulted to identify historic roads and properties that might be in the project area. A review of the NRHP indicated that Historic 66 (in Arizona) was nominated to the Arizona Register of Historic Places (ARHP) and NRHP as a multiple property in 1988. Historic 66 was nominated for its association with historic contexts of transportation and tourism in northern Arizona circa 1920–1944, was later expanded to include postwar years 1944–1956, and was recently extended to encompass the years between 1926 and 1970. SHPO has determined that segments of Route 66 should be evaluated individually to determine whether they retain sufficient integrity of location, design, materials, workmanship, and feeling to be included in the ARHP and NRHP.

2. Archaeological/Historical Sites

The cultural resources survey identified three historic sites in the project area. One property is the historic alignment of US 89, which is a contributing element of the Historic State Highway System (HSHS) under Criterion D, for its potential to yield important information about the development of

Arizona's roadways. The proposed project would add lanes to US 89, but the integrity of location, function, setting, and feeling of US 89 would remain intact.

Another property is the historic alignment of what used to be the Atchison, Topeka & Santa Fe Railroad. This site has not been fully evaluated for its eligibility for inclusion in the NRHP; however, the site would likely be considered as eligible under Criterion A. FHWA recommends it be treated as a Register-eligible site. The proposed project would not affect this property.

The last property is the historic alignment of Route 66. The overall site is part of the HSHS and has been nominated for inclusion under Criterion A for its association with the historic context of transportation and tourism in northern Arizona, circa 1920–1970, and under Criterion D for its potential to yield important information about the development of Arizona's roadways. The segment of Route 66 within the project area is considered a "noncontributing" element of this historic property. This segment does not retain any integrity of materials, setting, or feeling.

3. Agency/State Historic Preservation Office Determination

Consulting parties for this project include SHPO, the Arizona State Land Department (ASLD), and the Coconino National Forest. Because of the scope and nature of this project, FHWA determined that tribal consultation is not necessary. The SHPO concurred with a finding of "no adverse effect" on historic properties in a letter dated March 4, 2004 (Appendix B).

According to ADOT's *Standard Specifications for Road and Bridge Construction*, (2000a), Section 107 "Legal Relations and Responsibility to Public," Subsection 05 "Archaeological Features," "When previously unidentified archaeological, historical, or paleontological features are encountered or discovered during any activity related to the construction of the project, the contractor shall stop work immediately at that location and shall take all reasonable steps to secure the preservation of those resources and notify the Engineer." The ADOT Engineer would, in turn, notify ADOT's Environmental & Enhancement Group Historic Preservation Team (602-712-8636) to evaluate the significance of the resources.

The Preferred Alternative would have no short- or long-term impacts on the three cultural resources sites. The No Action Alternative would have no short- or long-term impacts on cultural resources.

F. Section 4(f) Resources

Section 4(f) of the US Department of Transportation Act of 1966 (as amended and recodified in 1983) states that the FHWA "may approve a transportation program or project … requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State or local significance, or land of an historic site of national, State, or local significance (as determined by the Federal, State or local officials having jurisdiction over the park, area, refuge, or site) only if— (1) there is no prudent or feasible alternative to using that land; and (2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use." (49 United States Codes § 303 [c])

A "use" of a Section 4(f) resource, as defined in 23 Code of Federal Regulations (CFR) § 771.135(p) occurs: (1) when land is permanently incorporated into a transportation facility; (2) when there is a temporary occupancy of land that is adverse in terms of the statute's preservationist purposes; or (3) when there is a constructive use of the land. A constructive use of a Section 4(f) resource occurs when the transportation project does not incorporate land from the Section 4(f) resource, but the project's proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired. For example, a constructive use can occur when:

a) The projected noise level increase attributable to the project substantially interferes with the use and enjoyment of a noise-sensitive facility of a resource protected by Section 4(f);
b) The proximity of the proposed project substantially impairs aesthetic features or attributes of a resource protected by Section 4(f), where such features or attributes are considered important contributing elements to the value of the resource. An example of such an effect would be the location of a proposed transportation facility in such proximity that it obstructs or eliminates the primary views of an architecturally significant historical building, or substantially detracts from the setting of a park or historic site which derives its value in substantial part because of its setting; and/or
c) The project results in a restriction on access, which substantially diminishes the utility of a significant publicly owned park, recreation area, or an historic site.

There are no recreation areas or wildlife or waterfowl refuges in the project area. There is one publicly owned park, existing and planned segments of the FUTS, and one historic site.

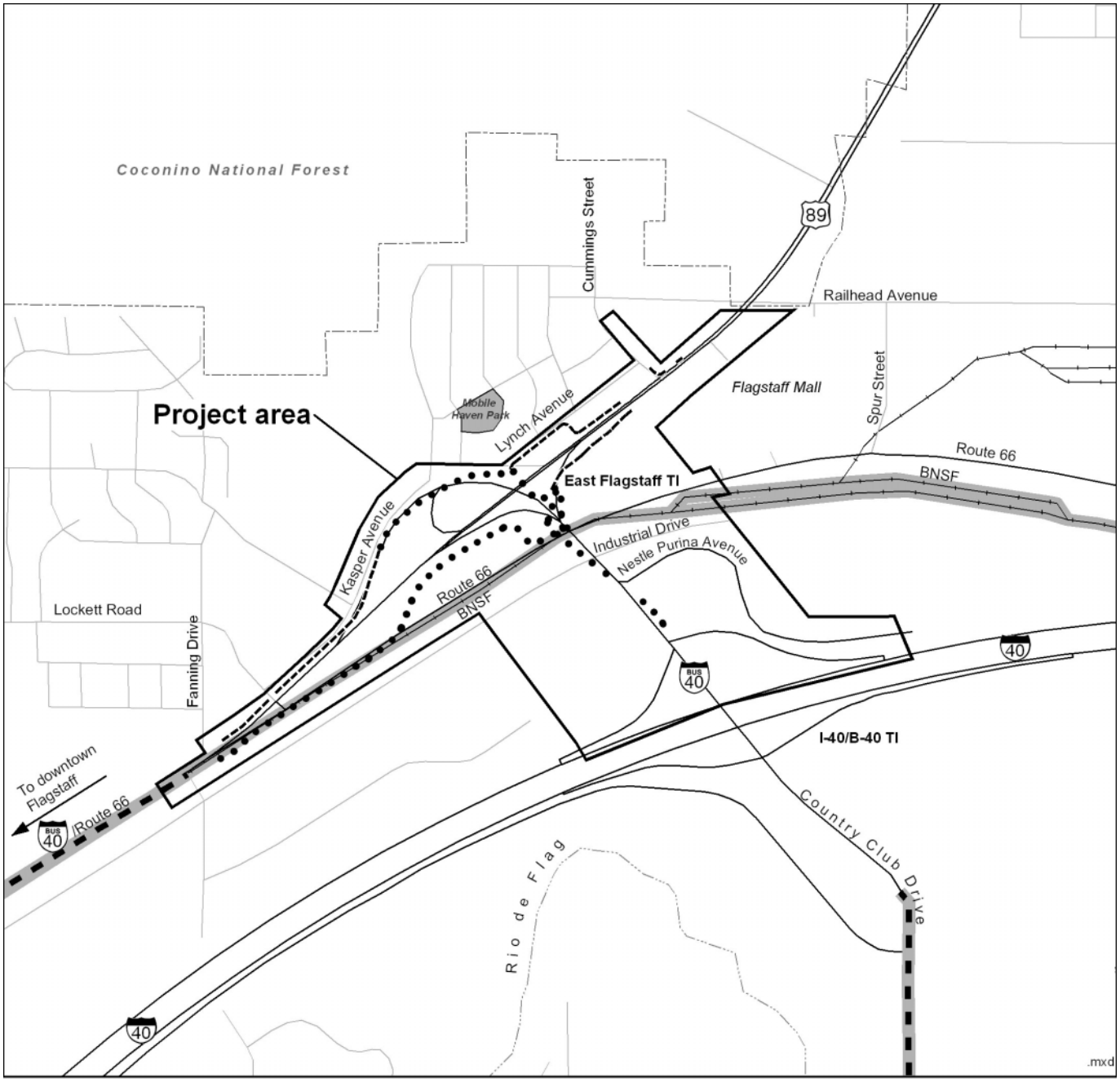
Mobile Haven Park, a 1.8-acre community park with a playground and picnic area, is located approximately 0.2 mile north of US 89. There would be no direct use of the park by the Preferred

Alternative. Access to Mobile Haven Park is from Kasper Avenue, Lynch Avenue, and Cummings Street. Kasper Avenue, Lynch Avenue, and Cummings Street intersect US 89 within the project limits and would remain open during construction. The East Flagstaff TI is not visible from Mobile Haven Park and would not become visible from the park as a result of proposed project improvements. Existing traffic noise from US 89 is minimal at the park because of the distance and the intervening buildings. The projected noise level would not interfere with the use and enjoyment of the park, and the project would not detract from the setting of the park, nor restrict access to the park. Therefore, according to 23 CFR § 771.135(p), there would be no direct or constructive "use" of this publicly owned park.

An existing segment of the FUTS is located adjacent to the western project limits, west of Fanning Drive (Figure 10). The FUTS is a public trail system developed, owned, and managed by the City of Flagstaff, primarily for recreation. The existing trail segment is located outside of the project construction limits and would not be directly impacted by construction of the Preferred Alternative (Figure 5). No portion of the existing trail would be converted to another use or permanently incorporated into a transportation facility. Access to this trail would not be negatively impacted by the proposed improvements, and the project would not result in noise levels that interfere with the use and enjoyment of the trail. Additionally, the project would not detract from the setting of the existing trail. Therefore, according to 23 CFR § 771.135(p), there would be no direct or constructive "use" of this existing recreation facility.

The completion of the FUTS trail link within the project limits is part of the *Flagstaff Area Regional Land Use and Transportation Plan* (City of Flagstaff 2001). The land would not be permanently incorporated into a transportation facility since the planned facility would be used for recreation purposes. No portion of the planned trail would be converted to another use or permanently incorporated into a transportation facility. The planned FUTS would not be negatively impacted in terms of the statute's preservationist purposes because the construction of the FUTS would meet the goal of the *Flagstaff Area Regional Land Use and Transportation Plan* and is intended to further and enhance, not hinder, the preservationist purposes as promoted by Section 4(f). No constructive use would occur from the construction of the Preferred Alternative because the alignment of the planned FUTS is consistent with the *Flagstaff Area Regional Land Use and Transportation Plan* and currently no recreational use facilities exist within the construction limits.

The historic alignment of the Atchinson, Topeka & Santa Fe Railroad (now part of the BSNF) is NRHP-eligible for its association with transamerica railroading, 1879–1950. The B-40 bridge structure passes over the BSNF tracks and would be replaced as part of the roadway improvements. Land would not be permanently incorporated into a transportation facility as a result of the Preferred Alternative.



Source: Arizona Transportation Information System Coverage (2002)

Key

- Project area
- Existing Section 4(f) resource
- Existing Flagstaff Urban Trails System
- Planned Flagstaff Urban Trails System
- Planned sidewalk
- Coconino National Forest boundary

Mile

0 0.25 0.5

NORTH

Figure 10. Section 4(f) resources

Because the historic alignment of the railroad is currently in operation, the Preferred Alternative would not change the features and attributes of the railway that contribute to the value of the historic alignment. The projected construction noise levels would not substantially interfere with the use. Noise levels after construction is complete would not increase as a result of the project. The introduction of pedestrian facilities would change the visual character. The project has been designed to visually complement the surrounding area and would not compromise the historic attributes of the railway alignment. The project would improve pedestrian accessibility and comply with ADA requirements, resulting in a beneficial impact to the pedestrians and other pathway users. The modification to the railway that would occur as a result of the project would not constitute a "use" of land as defined in 23 C.F.R. § 771.135(p) because the land would not be permanently incorporated into a transportation facility, there would be "no adverse effect" determination by SHPO, and there would be no "constructive use." Therefore, a Section 4(f) evaluation is not required.

The Preferred Alternative and the No Action Alternative would have no impacts, short- or long-term, to Section 4(f) resources in the project area.

G. Air Quality Analysis

The 1990 Clean Air Act Amendments (CAAA) require that air quality impacts be addressed in the preparation of environmental documents. As required by the CAAA, the US Environmental Protection Agency (EPA) set National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants: carbon monoxide (CO), nitrogen oxide, ozone, particulate matter, sulfur dioxide, and lead. EPA has designated those airsheds that have not met the NAAQS as nonattainment areas and classified them according to the degree of severity of their nonattainment status.

States that fail to attain the NAAQS for any of the criteria pollutants are required to submit a State Implementation Plan (SIP), which outlines actions to be taken to attain compliance. In an effort to reduce air quality emissions, the State Transportation Improvement Plan (STIP) also evaluates projects to provide a basis for impacts to local conditions. This project has not been included in the STIP. The project area lies within an attainment area for particulate matter less than 10 microns in diameter (PM_{10}), CO, nitrogen oxide, sulfur, and lead.

An air quality study of this project area for the Preferred Alternative was completed and reported in *Air Quality Technical Report US 89 East Flagstaff Traffic Interchange, Flagstaff, Arizona* (ADOT 2004c). The

air quality analysis for the project area focused on vehicular emissions of CO. Other pollutants, such as PM_{10} and oxides of nitrogen, are also components of vehicular emissions; however, the impacts to CO levels are assessed as a project-level impact, whereas PM_{10} and oxides of nitrogen levels are regional conditions. EPA is currently developing procedures for analyzing project-level particulate pollution impacts.

The CO concentrations projected for the Preferred Alternative range from 3.1 to 6.9 parts per million (ppm) for the one-hour and from 2.2 to 4.8 ppm for the 8-hour concentrations. Because the project area is fringe-urban in nature and is located within an attainment area, a one-hour background concentration of 2 ppm has been added to compare the levels of a given pollutant that would exist in the absence of the project. The projected levels are well below the state and federal standards of 35 ppm and 9 ppm for 1- and 8-hour concentrations.

Construction activities associated with the Preferred Alternative are of a short duration and would increase emissions of PM_{10} and CO that would have short-term negative impacts on the air quality during construction.

According to the *Arizona Department of Transportation Standard Specifications for Road and Bridge Construction*, (2000a), Section 104, "Scope of Work," Subsection 08, "Prevention of Air and Noise Pollution," "The contractor shall control, reduce, remove or prevent air pollution in all its forms, including air contaminants, in the performance of the contractor's work." The contractor would comply with all air pollution ordinances, regulations, orders, etc., during construction. All dust-producing surfaces would be watered or otherwise stabilized to reduce short-term impacts associated with an increase in particulate matter attributable to construction activity.

The Preferred Alternative would have long-term minor beneficial impacts on air quality in the local area by reducing congestion and, therefore, CO emissions, but short-term minor negative project area impacts may occur during construction.

The No Action Alternative would not provide for improved traffic flows, but would lead to increased congestion and CO emissions and long-term minor negative impacts on air quality in the local area.

H. Noise Analysis

An analysis of potential noise impacts was conducted within the project area, pursuant to the ADOT Noise Abatement Policy (NAP), dated March 21, 2000 (ADOT 2000b), and in accordance with the provisions of 23 CFR § 772 - Procedures for Abatement of Highway Traffic Noise and Construction Noise. The analysis was documented in *Noise Study Technical Report US 89 East Flagstaff Traffic Interchange, Flagstaff, Arizona* (ADOT 2004d). FHWA's Noise Abatement Criteria (NAC) are delineated by land use categories and their associated acceptable exterior noise levels (in dBA[6]).

There are three land use activity categories, as defined by FHWA's NAC, in the project area: Activity Category B – residences, picnic areas, parks, churches and schools; Activity Category C – developed properties not included in Activity Category B; and Activity Category D – undeveloped lands. Although other activity category land uses are present in the project area, Activity Category B land uses are generally considered noise-sensitive and are the focus of the traffic noise analysis. All the receivers represent Activity Category B land uses. The recommended NAC threshold for Activity Category B is 67 dBA. Noise impacts are also considered to occur if the sound level approaches this 67 dBA-equivalent energy level[7] (Leq) for Activity Category B land uses. "Approach" is considered to mean levels greater than 64 dBA for Activity Category B. This level is typically applied to exterior areas associated with the land use type where lowered noise levels would be of benefit. Traffic noise impacts also occur when the predicted traffic noise level substantially (15 dBA-Leq) exceeds the existing noise level.

The FHWA-approved noise model STAMINA/Optima 2.0 was used for noise computations for 2025. Future noise levels in the project area were evaluated for ten sensitive receivers located within 500 feet of the existing roadway centerline and represented residential land use, Activity Category B. The modeled noise levels along US 89 did not approach or exceed the NAC at any of the ten identified sensitive receiver sites for the existing (2003) traffic conditions and the 2025 traffic conditions (Table 14). Based on the preliminary noise analysis, the Preferred Alternative would not increase noise levels for sensitive noise receivers in Activity Category B above ADOT's NAC.

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[6] The decibel (dB) is a logarithmic unit that expresses the ratio of the sound pressure level being measured to a standard reference level. The human ear reacts differently to sound energy in different frequency ranges. An A-weighting curve reduces the perceived noise by a fixed number of dB, depending on the frequency. The resulting sound pressure level represents noise as the human ear perceives sound.

[7] Equivalent energy level is the steady state level which, in a stated period of time, would contain the same amount of sound energy as a time-varying sound level during the same period. It is, therefore, an average energy level.

Table 14. Summary of noise analysis

Receivers	NAC	Receiver description	Existing	No Action	Build
			Peak 2003 (dBA)	**Peak 2025** (dBA)	**Peak 2025** (dBA)
R1	B	Mobile home	58	61	59
R2	B	Mobile home	59	62	60
R3	B	Mobile home	60	63	62
R4	B	Mobile home	61	63	63
R5	B	Mobile home	60	63	63
R6	B	Mobile home	60	63	63
R7	B	Mobile home	61	63	63
R8	B	Mobile home	61	63	63
R9	B	Planned residential development	58	60	59
R10	B	Planned residential development	59	61	62
R11	B	Single-family residence	61	63	63

Source: ADOT 2004d.

According to the *Arizona Department of Transportation Standard Specifications for Road and Bridge Construction*, (2000a), Section 104, "Scope of Work," Subsection 08, "Prevention of Air and Noise Pollution," "The contractor shall comply with all local sound control and noise level rules, regulations and ordinances which apply to any work performed pursuant to the contract. Each internal combustion engine used for any purpose on the work or related to the work shall be equipped with a muffler of a type recommended by the manufacturer." In addition, the City of Flagstaff maintains a noise ordinance that precludes construction activities between the hours of 10:00 p.m. and 6:00 a.m., Monday through Saturday, and 9:00 p.m. to 7:00 a.m. on Sunday. The majority of the construction activities would occur during the daytime except when the contractor and the Resident Engineer determine that nighttime construction would be necessary.

The predicted noise levels for the Preferred Alternative average 1–3 dBA higher than the predicted existing noise levels. The predicted Preferred Alternative noise levels were 2 dBA lower to 1 dBA higher than the future No Action noise levels. The Preferred Alternative would produce long-term minor negative noise impacts in the project area. Short-term moderate negative impacts would be experienced during the construction of the Preferred Alternative, but would diminish once construction is competed.

The predicted future No Action noise levels were 2–3 dBA higher than the existing year noise levels. The No Action Alternative dBA levels in the project area are projected to increase 2–3 dBA and would produce long-term minor negative noise impacts in the project area.

I. Utilities

The following entities have utilities in the study corridor:

- Arizona Public Service Company (APS) – 69-kilovolt (kV) overhead electric lines
- Qwest Communications – fiber optic and overhead telephone lines
- AT&T – overhead telephone lines
- City of Flagstaff – 6-, 8-, 12-, and 18-inch water lines; 8-inch sewer line; and 24-inch reclaimed water line
- UniSource Energy Services

Linear facilities (e.g., power, telephone, gas) that parallel US 89 are generally located 1–2 feet outside of the ADOT R/W. A review of the ADOT Flagstaff District Permit Log shows permits have been issued to each of the above-mentioned utilities. The ADOT Utilities and Railroad Section indicates that these utilities do not have prior rights. Therefore, each utility in the existing R/W would be required to relocate at its expense.

Relocation of impacted utilities associated with the acquisition of new R/W would be done at ADOT's expense if the utility owners can demonstrate prior rights. Relocations, including the reestablishment of required vertical clearances, would be coordinated with the utility owners during the final design phase. The respective utility owners would be responsible for notifying customers of any potential service interruptions.

The Preferred Alternative would require acquisition of, and construction in, new R/W—which could impact existing utilities. Existing utilities adjacent to the R/W would also be impacted with the widening. Short-term minor negative impacts may occur because of possible interruptions in service during relocation activities and because of relocation costs associated with the Preferred Alternative. There would be no long-term impacts on utilities. The No Action Alternative would have no impact on utilities.

J. Visual Resources

The project area lies within the urbanized area of Flagstaff and is considered by the City to be one of the gateways to the community. There are a variety of architectural styles reflecting the mixture of materials, buildings, colors, and scale typically associated with a developed community. The project area is visually dominated by transportation facilities, including railways, interstate and local highways, and elevated overpasses. The developed land uses and associated infrastructure do not form a cohesive urban

landscape. The built elements tend to detract from the views of the adjacent mountain peaks and adjoining coniferous woodlands. The natural terrain has been substantially altered by development, but small drainages and landforms are still evident. The San Francisco Peaks and Mount Elden are visible to the northwest and are notable landmarks in northern Arizona. Vegetation in the project area is primarily located between the B-40 WB off-ramp and US 89. The scattered mature ponderosa pines in this area provide a visual connection to the National Forest lands. Near Cummings Street along the west side of US 89 is a narrow band of trees and small shrubs.

There would be short-term substantial negative visual impact created during construction because of the exposed earth, temporary roads used to carry detoured traffic, construction equipment, and removal of existing structures (bridges and buildings) and trees. The removal of vegetation and structures during construction would substantially change the existing visual character of the setting.

The Preferred Alternative would notably change the existing visual character of the setting because of the 45-foot-high retaining walls along the B-40 crossroad, the elevation of the US 89/B-40 interchange at approximately 16 feet above the existing ground, and the three detention basins along US 89. The new US 89/B-40 interchange and portions of US 89 would be a more prominent element in the existing urban setting and would be visible from the adjacent residential area.

As part of the proposed improvements, the City of Flagstaff, Coconino County, and ADOT have been working together as part of the Gateway Committee to evaluate and make recommendations on the aesthetic treatment of the new interchange and the FUTS. The landscape and aesthetic treatment plans would be reviewed and approved by the City of Flagstaff, Coconino County, and ADOT during design. Once the construction of the Preferred Alternative has been completed and the new plant material has matured, the overall scenic quality of the project area would be enhanced because the proposed improvements would create a more cohesive pattern in the landscape, complement the urban environment, and enhance the entrance to the community.

According to *Arizona Department of Transportation's Standard Specifications for Road and Bridge Construction*, (2000a), Section 104, "Scope of Work," Subsection 09, "Prevention of Landscape Defacement; Protection of Streams, Lakes, and Reservoirs," "The contractor shall give special attention to the effect of its operations on the landscape and shall take special care to maintain natural surroundings undamaged."

The Preferred Alternative would have short-term minor negative impact and long-term moderate beneficial impact on this resource in the project area.

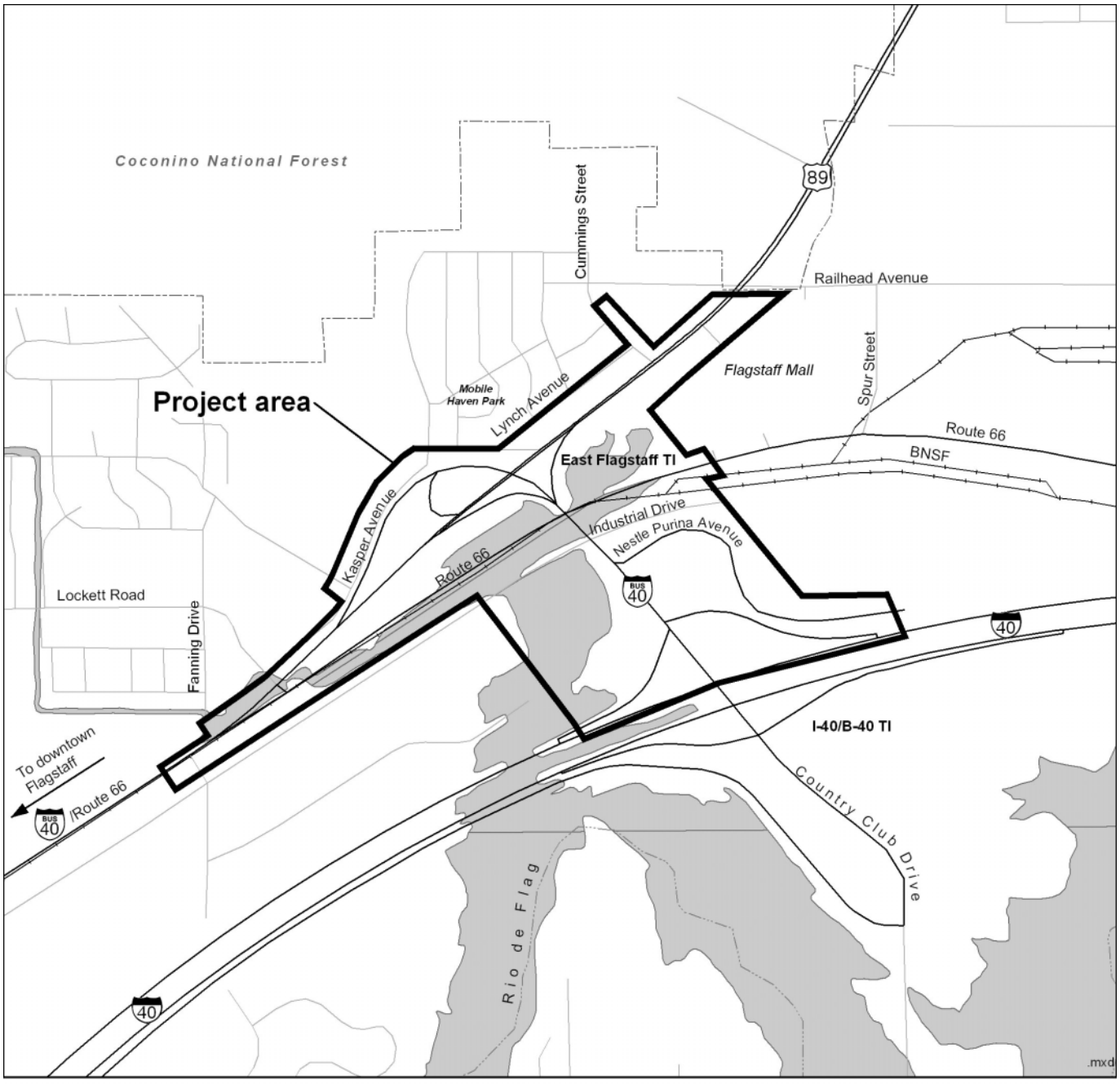
There would be no short-term or long-term impacts to the visual resources with the No Action Alternative.

K. Drainage and Floodplain Considerations

There are no springs, lakes, ponds, or other impoundments within the existing or proposed R/W. Most discharge occurs during the spring snowmelt and after occasional, intense thunderstorms. The snowmelt and rainfall patterns in the project area result in erratic flow of water that fluctuates daily, seasonally, and annually. Three unnamed washes cross the project area. Natural surface drainage and flows from the washes are channeled under US 89, B-40, and Route 66, primarily through pipe or box culverts.

A review of the Federal Emergency Management Agency (FEMA) floodplain maps (Community Panel: 040020 0003C dated September 30, 1995) indicates that portions of the project area are located within the designated 100-year floodplain (Figure 11).

An on-site drainage analysis was performed for the proposed improvements and existing on-site drainage systems. The analysis was documented in *Preliminary Drainage Report East Flagstaff Traffic Interchange, Flagstaff, Arizona* (ADOT 2004f). Any drainage structures and roadway improvements that encroach into the designated floodplain would be designed to meet both the ADOT criteria for a 50-year storm event and FEMA regulations. The drainage structures and roadway improvements would also meet FHWA guidelines for a 100-year storm for protection of adjacent private properties. Handling off-site run-off would be accomplished through implementation of three detention basins within the new project area. Excess drainage along US 89 to the west would be rerouted to a new detention basin in the area between US 89 and B-40. The existing system would be used to carry US 89 pavement drainage. Existing cross-culverts that meet current ADOT standards would be incorporated into the widened roadway through extensions, as necessary. The City of Flagstaff Floodplain Administrator (928-779-7685) would be provided an opportunity to review and comment on the design plans. The construction documents may be used as support documentation for the FEMA Conditional Letter of Map Revision and/or Letter of Map Revision applications if the Administrator determined that a map revision would be required.



Source: Q3 Flood Data, Federal Emergency Management Agency, 1997

Key

- Project area
- 100-year floodplain
- Coconino National Forest boundary

Mile

0 0.25 0.5

NORTH

Figure 11. Designated 100-year floodplain

The addition of detention basins and drainage structures would increase storage of stormwater, and, therefore, the Preferred Alternative would have a long-term minor beneficial impact to local drainage. Additionally, the proposed improvements would result in a smaller TI footprint; therefore, the project is not anticipated to have an overall impact to floodplains.

The No Action Alternative would retain the roadway in its current condition with continued drainage concerns at several locations. The 100-year storm protection would not be implemented; therefore, the No Action Alternative could lead to moderate long-term negative impacts to the operational conditions of the roadway.

L. Sections 404/401 of the Clean Water Act and Arizona Pollutant Discharge Elimination System

The US Army Corps of Engineers (COE) has jurisdiction over waters of the United States within the project area. A preliminary jurisdictional delineation completed for the project determined that waters of the United States do exist in the project area. Based on April 2003 regulations, it is anticipated that a Nationwide Permit would be required for the East Flagstaff TI. However, all required Clean Water Act Section 404 permits would be obtained according to current Section 404 regulations by ADOT prior to any work in waters of the United States.

Because more than 1 acre of land would be disturbed, an Arizona Pollutant Discharge Elimination System (AZPDES) General Permit would be required. ADOT's Roadside Development Section would determine who would prepare the Stormwater Pollution Prevention Plan (SWPPP). The Flagstaff District, in addition to the contractor, would submit the Notice of Intent and the Notice of Termination to Arizona Department of Environmental Quality (ADEQ).

The effects of sedimentation would be greatest during the construction and revegetation period. Potential sources of erodible material created during the highway construction process would include loose fill adjacent to canals and drainage features, disturbed earth from roadway leveling, and excavated and backfilled soil around roadway and drainage structures. Because of disturbance to surface soils, some sediment transport would be expected after construction is complete. Temporary sedimentation associated with construction would be managed by erosion control measures stipulated in ADOT's specifications. Erosion associated with the removal of vegetation would be controlled in accordance with ADOT's *Standard Specifications*, the AZPDES General Permit, and the SWPPP prepared for the project. As the disturbed areas are reseeded and vegetation reestablished, erosion would decrease to natural levels.

According to *Arizona Department of Transportation Standard Specifications for Road and Bridge Construction*, (ADOT 2000a), Section 104, "Scope of Work," Subsection 09, "Prevention of Landscape Defacement; Protection of Streams, Lakes, and Reservoirs," "the contractor shall take sufficient precautions, considering various conditions, to prevent pollution to streams, lakes, and reservoirs with fuels, oils, bitumens, calcium chloride, fresh Portland cement, raw sewage, muddy water, chemicals, or other harmful materials. None of these materials shall be discharged into any channels leading to such streams, lakes, or reservoirs." In the event of accidental chemical spills during construction, the site would be cleaned up to prevent chemicals being introduced into the surface or ground water systems. These measures would help protect both surface and ground water resources in the project area.

The Preferred Alternative would have no long-term negative impacts to jurisdictional waters because disturbance to jurisdictional waters is anticipated to be less than 0.5 acre and there are no special aquatic areas within the project limits.

The No Action Alternative would have no impact on waters of the United States.

M. Vegetation and Invasive Species

The project area is located within the Colorado Plateau Physiographic Province in northern Arizona, within the Petran Montane Conifer Forest Biotic Community (Pase and Brown 1994). The project area includes limited topographic relief, with elevations ranging from 6,895 feet to 6,940 feet above mean sea level. This is an urbanized setting, which influences the distribution of vegetation. Ponderosa pine (*Pinus ponderosa*) occurs within the project area, with most of the area dominated by ground cover of various species of grasses and forbs.

Approximately 52 acres of ground would be disturbed by construction activities for the proposed improvements to the East Flagstaff TI. Disturbance to roadside vegetation would be kept to the minimum necessary for construction of the project. Trees would be removed in the B-40 area north of US 89 to reduce overhang onto the off-ramp and provide a greater line of sight. Some trees may remain to provide screening of the off-ramp. All areas of disturbance would be reseeded with species native to the project vicinity. The proposed project's impacts on natural vegetation would be minimal.

Executive Order 13112 requires that each federal agency whose actions may affect the status of invasive species shall …"subject to the availability of appropriations, and within Administration budgetary limits, use

relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded."

In accordance with Executive Order 13112, the project area was surveyed by a qualified invasive species authority, and it was determined that three Arizona listed invasive species occur within the project boundaries: diffuse knapwood (*Centaurea diffusa*), scotch thistle (*Onopordum acanthium*), and dalmation toadflax (*Linaria dalmatica*). Additionally, ADOT determined through an invasive species survey that this project has a moderate risk of introducing or spreading invasive species.

Invasive species would be treated prior to construction according to ADOT's Natural Resources Management Section's invasive species management plan. To prevent the spread of invasive species to uncontaminated areas, all earthmoving and hauling equipment would be washed prior to entering or leaving the construction site. Vehicles not involved with construction, such as inspection or supervisory-type vehicles and contractor personnel vehicles, would be staged in an area where there are no invasive species present. All disturbed soils that would not be landscaped or otherwise permanently stabilized by construction would be seeded using native species to help prevent future reestablishment of invasive species. Any fill, seed, or mulch material brought in from off-site would be free of invasive species, and construction equipment would be free of invasive species and toxic materials. ADOT would continue any necessary treatments following construction completion according to the Natural Resource Management Section's invasive species management plan and would not likely result in the introduction of invasive species into the project area.

The Preferred Alternative would have short-term minor negative and long-term negligible negative impacts on vegetation in the project area.

The No Action Alternative would have no impacts on vegetation.

N. Threatened/Endangered Species, Designated Critical Habitat, and Sensitive Species

Species that may occur in Coconino County that are listed under the Endangered Species Act (ESA) by the US Fish and Wildlife Service as threatened, endangered, proposed, as candidate for listing, or as a species managed under a conservation agreement were reviewed for potential effects that might be attributable to

the proposed action (see Appendix C), and a Biological Evaluation (ADOT 2004e) was prepared. The only ESA listed species that may occur in the project area is the bald eagle (*Haliaeetus leucocephalus*). Marginally suitable roosting and foraging habitat is present, though no bald eagle nesting habitat is found in the project area. High levels of vehicle traffic and other urban disturbance factors are present throughout the area, including the area where the tree removal would occur. The Preferred Alternative would not affect the bald eagle or any other species protected under the ESA. No species of Wildlife of Special Concern in Arizona were identified in the project area.

The Arizona Department of Agriculture's protected native plant list was reviewed, and it was determined that there are no protected native plants in the project limits. The Preferred Alternative would have no impact on any threatened or endangered species or species of special concern or on native vegetation in the project area.

The No Action Alternative would have no impact on any threatened or endangered species, species of special concern, or on native vegetation.

O. Hazardous Materials

Hazardous materials are regulated by the Resource Conservation and Recovery Act and the Comprehensive Environmental Response, Compensation, and Liability Act, as amended (commonly known as Superfund). ADEQ enforces the regulations promulgated under these Acts as well as the Reauthorization Act of 1986. The inherent environmental concerns associated with hazardous materials required a preliminary investigation into the location of permitted and nonregulated hazardous material sites within the project area.

A Preliminary Initial Site Assessment was completed by ADOT in 2003. A review of the ADEQ and EPA databases conducted in January 2004 showed that there are underground storage tanks in or near the project area. There were no active landfills or hazardous waste treatment, storage, and disposal facilities within or adjacent to the project area.

Two bridges within the project site would need to be surveyed for asbestos or lead-based paints prior to project construction. If these structures are found to contain asbestos, ADOT would need to follow the notification requirements for the Asbestos National Emission Standard for Hazardous Air Pollutants and ADEQ would need to be contacted.

According to *Arizona Department of Transportation's Standard Specifications for Road and Bridge Construction,* (ADOT 2000a), *S*ection 107, "Legal Relations and Responsibility to Public," Subsection 07, "Sanitary, Health, and Safety Provisions," "During construction operations, should material be encountered which the contractor believes to be hazardous or contaminated, the contractor shall immediately do the following: (1) stop work and remove workers within the contaminated areas … (2) barricade the area and provide traffic controls … and (3) notify the Arizona Department of Transportation Engineer ... ." The ADOT Engineer would arrange for proper assessment, treatment, or disposal of those materials. Such locations would be investigated and proper action implemented prior to the continuation of work in that location.

The Preferred Alternative could have impacts on hazardous materials because of lead-based paint concerns and because of the potential for asbestos associated with the bridges. Therefore, there could be short-term minor negative site-specific impacts to hazardous materials and no long-term impacts.

The No Action Alternative would have no impacts on hazardous materials.

P. Material Sources and Waste Materials

Approximately 70,000 cubic yards of borrow material would be required to complete the proposed improvements to the East Flagstaff TI. No material source has been identified for the borrow. Any material sources required for this project outside of the project area would be examined for environmental effects, by the contractor, prior to use, through a separate environmental analysis in accordance with *Arizona Department of Transportation's Standard Specifications for Road and Bridge Construction,* Section 1001 Material Sources, Subsection 2, "General" (ADOT 2000a).

According to *Arizona Department of Transportation Standard Specifications for Road and Bridge Construction,* (ADOT 2000a), Section 107, "Legal Relations and Responsibility to Public," Subsection 11, "Protection and Restoration of Property and Landscape," "Materials removed during construction operations such as trees, stumps, building materials, irrigation and drainage structures, broken concrete, and other similar materials shall not be dumped on either private or public property unless the contractor has obtained written permission from the owner or public agency with jurisdiction over the land. Written permission would not be required, however, when materials are disposed of at an operating, public dumping ground." Excess waste material and construction debris would be disposed of at sites supplied by the contractor or at a municipal landfill approved under Title D of the Resource Conservation and Recovery

Act, construction debris landfill approved under Article 3 of the Arizona Revised Statutes 49-241 (Aquifer Protection Permit) administered by ADEQ, or an inert landfill.

Although the Preferred Alternative would require borrowing material from sources outside the project area, these materials would be evaluated and approved by ADOT prior to the work and, therefore, would be expected to have no negative impact on waste materials for this project.

With the No Action Alternative, there would be no need to bring in borrow materials, so there would be no impact on material sources and waste materials.

Q. Secondary and Cumulative Impacts

An assessment of indirect (secondary) and cumulative impacts is required by CEQ regulations (40 CFR § 1500–1508) to satisfy the requirements of NEPA. The assessment of secondary and cumulative impacts in this EA was made based on guidance provided in the April 1992 FHWA position paper *Secondary and Cumulative Impact Assessment in the Highway Project Development Process*, the January 1997 CEQ handbook *Considering Cumulative Effects Under the National Environmental Policy Act*, and FHWA's January 2003 *Interim Guidance: Questions and Answers Regarding Indirect and Cumulative Impact Considerations in the NEPA Process*. The terms "impacts" and "effects" are used interchangeably in the CEQ regulations (40 CFR § 1508.8), and, according to FHWA guidelines, the terms "secondary" and "indirect" are used synonymously as well. The level of detail and documentation of secondary and cumulative impacts provided in this EA correspond with the potential for the Preferred Alternative to involve these impacts. Environmental resources that are not directly impacted by the proposed action would not contribute to an indirect or cumulative impact and are not discussed in this section of the EA. The analysis focuses on current and future actions that would be reasonably expected to contribute to cumulative impacts on key resources.

Secondary effects are broadly defined by CEQ as those impacts that are caused by an action and occur later in time or are farther removed in distance but are still reasonably foreseeable after the action has been completed. Cumulative effects are the combined environmental impacts that result from the incremental effect of the proposed action when added to past, present, or reasonably foreseeable future actions. Only past, present, and reasonably foreseeable future actions that have similar effects and incrementally add to the cumulative impacts of the No Action and Preferred Alternatives are considered.

1. Past, Present, and Reasonably Foreseeable Future Actions

For this assessment of cumulative impacts, past, present, and future transportation and nontransportation-related projects in the geographic area of influence were evaluated based on the best available information from relevant planning agencies. Generally, these projects would contribute to enhanced access to the surrounding areas. The 2025 design year was used for the analysis and represents the estimated duration of service life for the Preferred Alternative. Given the relatively recent urbanization of the region, the past time horizon was defined by the earliest identifiable action, the initial construction of the East Flagstaff TI in 1968.

a. Past Actions/Completed Projects

Current resource conditions are detailed in Sections B through P of *Chapter IV. Affected Environment, Environmental Consequences, and Mitigation Measures*. The key past actions that directly and indirectly resulted in these current conditions are listed below. The continued implementation and use of the following actions since their completion are implied:

- Drainage and grading improvements along US 89 between mileposts (MPs) 418.98 and 420.93 in 1973.
- Widening and drainage and grading improvements along US 89 between MPs 420.04 and 425.94 in 1990.
- Traffic signal placement along US 89 between MPs 419 and 421 in 1983, 1988, and 1992.
- Lighting improvements along US 89 between MPs 419.0 and 420.87 in 1995.
- Drainage improvements along US 89 from Fanning Drive to the city limits.
- Pavement overlay on the B-40 on-ramp from the junction with Route 66.
- Reconfiguration of signals at Railhead Avenue and the Flagstaff Mall.

b. Ongoing/Present Actions

The following present actions occur within the geographic area of influence:

- From 1990 to 2000, there has been a 33 percent increase in the number of single- and multifamily residential properties. With an annual increase in population of 1.7 percent, this trend is expected to continue.
- Pavement overlay on Route 66 to Walnut Canyon.
- Reclaimed water line along Kaspar Avenue between Lockett Road and Lynch Avenue.
- Fourth Street Railroad overpass.

c. Reasonably Foreseeable Future Actions

The following future actions are reasonably foreseeable within the geographic area of influence:

- Expansion of the Flagstaff Mall.
- Development of land northeast of the Mall for an auto dealership and business complex.
- Development of the Mount Elden housing development.
- Development of McMillan Mesa Village Master Plan.
- Capacity improvements to I-17 from Kachina Village to I-40.
- Capacity improvements to I-40 from Flagstaff Ranch Road to Country Club Drive.
- Construction of the Lone Tree Road I-40 Interchange.
- Woody Mountain Road connection to Beulah Boulevard.
- Lone Tree alignment to John Wesley Powell Boulevard.
- John Wesley Powell Boulevard extension to 4th Street.
- Fourth Street extension through Canyon Del Rio.
- Construction of Pulliam Airpark Roadway.
- Pavement overlay along Route 66/B-40 from Fanning Drive to Switzer Canyon Road.
- Enterprise railroad grade separation.
- Tank Farm railroad overpass.
- Soliera Avenue extension to 4th Street.
- Beulah Boulevard and University Drive extension.
- Construction of the Munds Park I-17 Interchange.

2. Analysis of Secondary and Cumulative Effects

Potential impacts are discussed qualitatively in the following text and are evaluated based on how the Preferred Alternative might directly influence subsequent development. Selection of the No Action Alternative could contribute to any cumulative resource impacts. All impacts described are considered long-term. Short-term effects, such as construction-related impacts, are assumed to not contribute to cumulative effects. In general, the impacts on each environmental resource are identified as *secondary* or *cumulative* in nature and as either having a *beneficial* or *negative* impact on a given resource. The magnitude or degree of impact is classified as *negligible*, *minor*, *moderate*, or *major*. For example, a *beneficial, moderate cumulative impact* means that the cumulative change in the environmental resource would be positive and the magnitude of the change in the resource is considered to be moderate.

a. Land Use and Economic Resources

Even with the improvements to the East Flagstaff TI or the expansion of the Flagstaff Mall, conversion of available undeveloped private land in the area to residential or commercial users might not occur. The *Regional Plan* (Flagstaff 2001) identified that 16,665 acres of land will be needed to accommodate future residential, commercial, and industrial development by 2020. The Arizona Department of Economic Security projects that by 2020 the population of the region will grow to 104,000, which represents an annual growth rate of 1.7 percent. Although there would be pressure to convert tracts of forestland for development, *Flagstaff 2020* promoted redevelopment as a means to provide affordable housing for a variety of income levels. It recommended blending new models, such as the New Urbanism, clustering, mixed-use development, and infill with existing neighborhood attributes to enhance the quality of life.

Zoning is in place in the unincorporated areas of the county to protect the area's desired rural land use character. The No Action and the Preferred Alternative would not alter the rate of changes in land use and, therefore, would not contribute to negative secondary or cumulative impacts on land use or economic resources in the project vicinity.

b. Air Quality

The Preferred Alternative, along with other current and future transportation and nontransportation-related actions, such as roadway capacity improvements would improve the flow of traffic. In conjunction with the NAAQS, the Preferred Alternative would contribute to maintaining current attainment levels or would provide beneficial minor secondary and cumulative impacts to air quality.

The No Action Alternative would continue to contribute to the detrimental effect on air quality by not alleviating congestion on the roadway and by causing increased emissions from idling traffic.

c. Noise

Existing and future commercial and recreational vehicular traffic would be the primary noise sources in the project area. The proposed project is not expected to contribute to an increase in traffic. The Preferred Alternative, along with other future transportation and nontransportation-related actions, would increase roadway capacity and improve the flow of traffic. These actions would contribute to minor secondary and cumulative noise impacts on existing and future sensitive receivers.

The No Action Alternative could continue to contribute to a minor increase in long-term noise levels since roadway congestion would continue to increase, therefore increasing the length of time that individual vehicles contribute to cumulative noise levels.

d. Native Vegetation and Wildlife Habitat

Although there is incomplete impact documentation, it can be assumed that many past construction projects, including I-40, Route 66, US 89, and development in Flagstaff contributed to a cumulative loss of and/or fragmentation of habitat and of native vegetation. Implementation of the Preferred Alternative would also contribute to this habitat impact. The presence of National Forest lands helps reduce the potential loss of habitat and vegetation from development for housing or other uses by retaining the land for multiuse purposes. The undeveloped northern portion of the project area is characterized by sparse vegetation, but is considered to have wildlife habitat of limited value. The southern portion of the project area is characterized by the urban fringe of Flagstaff, which provides marginal habitat value.

The No Action Alternative would retain the vegetation in its current state and would have no impact. The construction of the Preferred Alternative and other transportation and nontransportation-related projects would contribute to the minor negative secondary and cumulative loss of native vegetation and wildlife habitat.

V. PUBLIC INVOLVEMENT

A. Agency and Stakeholder Scoping/Consultation

Coordination letters were sent to the following agencies and stakeholders:

- ADEQ
- Arizona Department of Public Safety
- Arizona Game and Fish Department (AGFD)
- APS
- ASLD
- City of Flagstaff
- Qwest Communications
- Coconino County Public Works Department
- Coconino County Sheriff
- Northern Arizona Council of Governments
- Coconino National Forest

An agency coordination meeting was held on December 3, 2003, at the Flagstaff City Council Chambers to obtain input regarding the potential social, economic, and environmental issues associated with the proposed improvements to the East Flagstaff TI. A copy of agency correspondence is included in Appendix D. AGFD provided a list of Wildlife of Special Concern and designated a point of contact.

B. Public Coordination

A public scoping meeting was also held on December 3, 2004, at the Neil V. Christensen Elementary School in Flagstaff. Three thousand post cards were mailed to citizens living within ZIP codes adjacent to the project area to notify the public of the meeting's time and place.

The purpose of the public meeting was to display and discuss the East Flagstaff TI recommendations from the 2002 DCR and to obtain public input regarding issues associated with the current TI improvement study. Seventy-one people attended the meeting. Each received a handout describing the study purpose, a graphic portraying the current and future traffic volumes, graphics from the DCR showing TI alternatives to be studied, and a comment sheet. A brief presentation was made by ADOT and its consultants on the 2002 *East Flagstaff TI Design Concept Report* recommendations. Full-size graphics of the three TI alternatives were placed around the room to allow participants to record their comments by use of "sticky notes" applied directly to the graphics. Comment sheets were also available for participants. From the 71 participants, 89 written comments were made regarding the different alternatives. A summary of the written and verbal comments is presented in Appendix E. Also included in Appendix E are responses to letters received after the public meeting.

In April 2004, 3,000 newsletters were mailed to citizens living in ZIP codes adjacent to the project area. The newsletter provided project information and announced the project Web site, < www.dot.state.az.us/ROADS/flagstaff/ East_Flagstaff_TI/home/home.html >.

A public hearing will be held on the Draft EA; a copy of the notice is included in Appendix F.

VI. CONCLUSION

The potential environmental impacts of the proposed improvements were evaluated based on both the context of the effects on the project area and the intensity or severity of impacts as defined in the CEQ Regulations. Table 15 summarizes the potential environmental impacts.

Table 15. Summary of Environmental Assessment

Environmental consideration	Result of No Action Alternative evaluation	Result of Preferred Alternative evaluation
Land ownership, jurisdiction, or land use	No impacts	Short-term minor negative impacts Long-term minor negative impacts
Social and economic resources	Long-term minor negative impacts	Short-term moderate negative impacts Long-term minor beneficial impacts
Title VI/Environmental Justice	No disproportionate impacts	No disproportionate impacts
Cultural resources	No impacts	No impacts
Section 4(f) resources	No impacts	No impacts
Air quality	Long-term minor negative impacts	Short-term minor negative impacts Long-term minor beneficial impacts
Noise levels	Long-term minor negative impacts	Short-term moderate negative impacts Long-term minor negative impacts
Utilities	No impacts	Short-term minor negative impacts No long-term negative impacts
Visual resources	No impacts	Short-term minor negative impacts Long-term moderate beneficial impacts
Drainage and floodplain effects	Long-term moderate negative impacts	Long-term minor beneficial impacts
Sections 404/401 and AZPDES	No impacts	No long-term negative impacts
Vegetation and invasive species	No impacts	Short-term minor negative impacts Long-term negligible negative impacts
Threatened/endangered/sensitive species	No impacts	No impacts
Hazardous materials	No impacts	Short-term minor negative impacts No long-term negative impacts
Material sources and waste materials	No impacts	No negative impacts expected
Secondary and cumulative impacts	Long-term minor negative impacts	Long-term minor negative impacts

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